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JOURNAL

OF

THE PROCEEDINGS

OF

THE LINNEAN SOCIETY.

BOTANY.

VOL. VII.

LONDON:
SOLD AT THE SOCIETY'S APARTMENTS, BURLINGTON HOUSE;
AND BY
LONGMAN, GREEN, LONGMAN, ROBERTS & GREEN,
AND
WILLIAMS AND NORGATE.
1864.

PRINTED BY TAYLOR AND FRANCIS,
RED LION COURT, FLEET STREET.

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JOURNAL OF THE PROCEEDINGS

OF THE

LINNEAN SOCIETY OF LONDON.

Letter from Mr. G. MANN, Government Botanist, describing his Expedition to the Cameroon Mountains. Communicated by Sir W. J. HOOKER, F.R.S., F.L.S., &c.

[Read June 5, 1862.]

SIR,—I have the honour to transmit to you a Report upon my expedition to the Cameroon Mountains, and at the same time to advise you that the collections which I made there are shipped to England in the same steamer that brings this letter.

I left Fernando Po on the 4th December, 1861, about 2 P.M., in a boat which I had anxiously awaited for a week. As soon as we had left the harbour and sailed round Point William, we were favoured by a strong sea-breeze, and reached Cape Horatio before sunset; whence we steered towards Ambas Bay, and, shortly before night set in, saw the Cameroons rising from the sea, and losing themselves in the clouds. Soon after 8 P.M. the islands in Ambas Bay came in sight, and after passing the first (Mondori Island), the sails were taken in, and the anchor let go. On the next day we reached the anchoring-place at 8 A.M., when I immediately landed. On landing I was received by my old host, and on reaching the house of the Rev. Mr. Saker, was informed he was at the Cameroons; but I received permission to keep the goods, which I had brought for barter, in the magazine of the mission. The place was as I found it a year before.

In the latter half of the day, I was much refreshed by the constant sea-breeze, which in Fernando Po we seldom enjoy, and which renders Victoria such a pleasant and agreeable residence for Europeans. How much more beneficial it would be for invalids if a sanitarium was established on one of the many hills which surround this settlement, when Europeans, and especially the English, who live in great numbers in the vicinity, could in five or six days exchange the dangerous climate of the Gulf of Guinea for their own, without the great expense with which such an exchange is at present connected.

The forest surrounding the settlement is the same that I saw last year,—beautiful in the beginning of December, when, from the change of season, many of the trees appeared in all the beauty of their young foliage, with large masses of flowers among various shades of green. Especially conspicuous was a species of *Baphia* ?, the flower of which looked like a peony. *Lophira alata* was already in full flower: the lady natives wear in their hair and ears the light-red wings of the fruit of this plant. The shore is bordered by an *Amomum* (1034 of list), which is here very common along the coast; but I endeavoured in vain to find the white-flowered species which I noticed last year. *Monodora grandiflora* was conspicuous from its beautiful foliage; but my hope of obtaining fruits for the Museum was vain, for I had come too late, and they were already fallen. I found, however, living seeds, which I believe to be distinct from the specimen which I sent from St. Thomas's in fruit, and Prince's Island in flower. The fruits are the same.

I found the interpreter, who accompanied me last year in my excursion to one of the highest villages on the mountain, still in Victoria, and ready to accompany me on this expedition. When, however, he heard that I should be ready in one or two days to leave the coast, he made many difficulties; and the two following days were passed, with the aid of the missionaries, in tedious endeavours to organize my party of interpreters, guides, and porters.

On the 10th December, H.M.S. Bloodhound anchored near the settlement; and Consul Burton, accompanied by Commander Dolbin, landed. The former informed me that it was his desire to visit the mountains also; and we agreed that, ten days later, I should send down some of my people to Victoria, in order to fetch some more food, and at the same time to serve as guides to Consul Burton. On the night of the 12th–13th, the rainy season bade farewell to the coast; after a few days of fine weather, however, the rain poured down again, and brought to my recollection all the difficulties under which I had brought my first collection from the mountain of Fernando Po. At the same time I determined to commence my ascent on the next day, with or without the leave of the natives.

Both the chiefs of Bassumba, the first village up the mountain, having come to the market, I agreed to go with them to their homes, and thence to Mapanya. I also met with eight natives of Bassumba, who were willing to carry part of the things for four pieces of cloth (worth £4); and on the 13th I finally left the settlement, with one interpreter, six Kroomen, and eight natives.

Mr. Pinnock, of the mission, living in Victoria, accompanied me, and after a five hours' walk we reached the village of Bassumba (alt. 1492 ft.*).

The country through which we passed was of the same forest tract that surrounds Victoria; amongst the trees was principally conspicuous an *Eriodendron*, which attained an enormous circumference. Also *Anthocleista nobilis* and *Monodora grandiflora* were conspicuous from their beautiful foliage, and *Sterculia tragacantha*, without leaves, but covered with carmine-coloured fruit. *Ipomœa* and *Momordica* grew over the trees and bushes on every side where the wood was a little more open. Among the ferns was chiefly observable a beautiful *Hypolepis*.

Here and there the forest was broken by a plantation of plantains; and where the wood had been thinned, the surface was occupied by *Saccharum spontaneum*, *Panicum plicatum*, and *Amomum Danielli*, which over-ran the roads wherever sufficient air penetrated through the trees.

Crossing a small river, a small Aroid (*Anubias Barteri*, Sch.) attracted my attention by its beautiful snow-white flowers; it covered the stones in the stream, as well as the banks. *Anchomanes Hookeri* was seen on every side, yet manifestly smaller than in Fernando Po. *Elæis Guineensis* and *Raphia vinifera* are common; the latter grows to the height of 700 feet above the sea, and, as everywhere on the coast, forms the chief material in the construction of the huts.

When I wanted to leave Bassumba, on the morning of the 14th, to go to Mapanya, all the natives declared they were tired, and that they could not go until the following day; so that I was compelled to wait. I made an excursion during the day, and found, amongst other things, the large Aroid bulb which I send alive.

I gave the interpreter leave to go back to the settlement to see his sick mother, on condition that he came back in the evening;

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* This and the following altitudes are approximate only, calculated from boiling-point observations.

but he did not do this, and I should have been in great difficulty if Mr. Pinnock had not had a youth with him who was acquainted with the language, and whom he kindly allowed to remain with me.

After another altercation with the natives, who employed every stratagem to obstruct my ascent, we left the place on the 15th, and after a four hours' walk reached Mapanya (alt. 3146 ft.). The way led through the forest and cultivated fields of plantains, where an *Erythrina* thickly covered with flowers, but without leaves, looked like masses of flame in the distance, and beautifully adorned the landscape. Before reaching Mapanya I observed the last *Elæis*, which was not above 40 feet high, and had a very dwarfed growth. The natives here are accustomed to climb the palm-trees at break of day, and bring down the palm wine, leaving an empty gourd-flask for the next day. During this employment they make a loud laughing cry, which is repeated from the surrounding trees, and which I can compare to nothing better than to the crowing of cocks. The palm oil is only prepared for household use on the mountain, and the fresh nuts taken out of the spikes are carried to market.

I found the chief Botani an unusually polite man, and very different from the one I had previously seen. He had one of the huts cleaned for me at once, and asked about my requirements. I only wanted water, which he provided for a reward in tobacco. The natives here do not smoke, but snuff all the more; consequently I had provided myself with the latter article, which the people of both sexes 'accepted.' Even children of three or four years took a pinch, which plainly showed the custom to be an old one with them.

On the next morning at daybreak, the chief told me that the guide was ready to go with me up the mountain, whereupon I left the hut, and, to my no small astonishment, found eleven instead of one! I now gave the chief his arms, and made each of the people a present of some clothing and tobacco. I then gave four of my Kroomen orders to go back with Mr. Pinnock to Victoria, and await the arrival of Consul Burton, and return with him. I then left the place, with two of my people, accompanied by eleven natives. First we ascended a few bushy hills with a few trees, and on both sides of the way saw *Saccharum spontaneum*, 8–10 feet high. The *Amomum* had disappeared, and two species of *Impatiens* were common. When we had left behind the last plantation of plantains, we found ourselves in a forest in which I soon recognized the beginning of the fern region, and soon the valleys were seen filled with beautiful *Cyatheas*. The stems of the trees were clothed with *Trichomanes*; and *Dicksonia selinifolia* grew on nearly every stem of *Cyathea*. *Hypolepis pteridioides* appeared; and a small Orchid, not in flower, grew over the branches of the trees. The soil was covered with a thick clothing of *Selaginella Vogelii* as with a beautiful green carpet, and adorned with the beautiful flower-heads of a *Hæmanthus* 6 inches in diameter, and the less conspicuous but no less beautiful flowers of a species of *Calanthe*.

After an hour's walk through the forest, we reached the end of a lava-stream which flowed from the mountain in a S.S.W. direction. The extremity or basin (?) (alt. 4967 ft.), in which I sank to the loins, and which contained a great quantity of water, was clothed with a small *Nephrolepis*, and the moss, No. 1413. Here the *Ericinella* appeared first, in company with *Leucothoë angustifolia*, *Rubus apetalus*, and *Clematis Simensis*, on the border of the wood which fringed both sides of the stream. After we had climbed on the lava for an hour, the *Nephrolepis* disappeared, and the moss and lichens, Nos. 1411, 1412, took its place; these, we everywhere found, formed the first vegetation on the lava-field. Near these, two species of Orchidaceæ were observed, which continued for the next five hours, when they were succeeded by *Crassula Mannii*. After the lapse of this time, I saw before me three small hills, of which two were coloured black, and formed the crater from which the lava-stream had flowed. When we reached this, my guides asked me where I would sleep; to which I replied, where I could find water. (Altitude of base of these hills 7309 ft.)

Consequently we made only a short rest here, and passing the base of a row of hills, we reached, after twelve hours' walk, the beginning of a forest at the bottom of a grass-grown crater, and followed a footpath which seemed to be for the use of hunters. I here saw the small *Blæria spicata*, and the other beautiful plants *Hypoxis villosa*, var., and *Sopubia Madagascariensis*.

On approaching the borders of the wood, I saw *Hypericum angustifolium*, and the magnificent plant *Lasiosiphon glaucus*, in full flower. *Pittosporum Mannii* and *Paratropia Mannii* gave the forest a beautiful fresh green, while the other *Paratropia* (*P. elata*) had lost nearly all its leaves, and was just coming into flower.

On entering the forest, I found myself among a mass of flowers which highly delighted me; there was, indeed, scarcely a leaf to be seen. Two Acanthaceæ were loaded with flowers. There was also the leafless *Plectranthus insignis*; and I also saw, for the first time, the third species of *Impatiens* and the various Umbelliferæ of the collection. My portfolio was soon filled, and I left the collecting of most of the plants until another visit.

After penetrating a few hundred paces into the wood, we found a spring which afforded good water in abundance. This was a most fortunate circumstance, as it removed all the difficulties I had dreaded, and made me nearly independent of the natives. (Alt. 7880 ft.) After filling our vessel with water, I wandered about comfortable and happy; and when we had gone half-an-hour's walk further, we came to a small hut, in which some of the natives prepared their beds, while I pitched my tent close by, —the rest of the party going a little further to a hollow, as there was not room enough in the small hut for all. I was only disturbed once in the night by the howling of a hyæna close by my tent, and, after a sound sleep, was awakened in the morning by the laughing cry already mentioned, from the natives in the hollow.

As we proceeded, numerous mountains rose before us, and amongst them one distinguished by its height. Towards this I turned, with the intention of ascending it, but had not reached it when I perceived that nearly all the natives had left me; and the two who remained also refused to go any further. I desired them to await my return, and I went on, with both my Kroomen, to the mountain. When I reached its foot, I saw a still higher one, to which I then turned; but I was for some minutes enveloped in so dense a cloud that I could see nothing around me; moreover, not being able to go much further, since I had no food, and the natives had gone back, I returned to the mountain we had left. Its summit (alt. 9139 ft.) I now climbed, and hung up my self-registering thermometer, and following the natives, who indicated to me the road by the blowing of a cow-trumpet, as the clouds prevented my seeing more than ten paces ahead, I soon reached the top, and turned directly to the lava-field. On that being crossed, I observed, on the borders of the wood, *Cynoglossum micranthum* and the *Adiantum*, No. 1367, and later, on another field of lava, the *Cheilanthes*, No. 1372: *Trifolium Simense*, *Cyanotis Abyssinica*, and a species of *Habenaria* were all dried up. On returning, I found the descent of the lava-stream as difficult and fatiguing as the ascent, and reached Mapanya again at about six in the evening, without shoes, as both the pairs which I had taken with me were completely destroyed by the sharp lava.

On the following afternoon I heard that Europeans were approaching, and saw the principal men very busy in performing certain ceremonies to ward off bad luck. These consisted, first, in pouring water over a small broom on a stone in the middle of the village, and repeating this ceremony on all the roads that led out of the village. The strangers soon appeared, and I was delighted to see not only Consul Burton, but also Mr. Saker and Signor Calvo, the Judge of Fernando Po.

The two following days were consumed in altercations with the natives, and it was not until the morning of the 22nd that we were able to start for the spring previously mentioned, where we intended to leave a great part of our things concealed. Halfway across the lava-stream, Consul Burton pointed out to us a place where, with little labour, water might be found in case of need: this we distinguished as "Burton's well."

When we arrived at the foot of the first crater, finding it impossible to proceed further, we determined to encamp for the night. As we had suffered all day from the want of water, which prevented many of our people from travelling so quickly as ourselves, and we had no hope of their reaching the crater before night, I and some of our attendants went to fetch water; and on returning soon after sunset, found that half of the people had not yet reached the place.

After a cold night, which we passed wrapped in our clothes upon the ashes, at 4 A.M. we sent some of our people again for water; and on their return, all present were despatched to the spring with our baggage, and desired to prepare a sleeping-place. We ourselves waited till 2 P.M. for those who were still missing; but as they had not then arrived, we left the place, leaving behind one man with a supply of water for them. We reached the rendezvous in a quarter of an hour, and the rest of the people arrived at 5 P.M.

On the morning of the 24th we made an excursion to the mountain where I had left my thermometer, and found the reading to be, max. 71¼, min. 39¼. This mountain was named by Mr. Saker "Mount Helen." (Alt. 9450 ft.)

We had splendid weather; and a wonderful panoramic view spread around us—the principal mountain presenting two conspicuous summits, which we named "Mount Victoria" and "Mount Albert." After Consul Burton and Mr. Saker had made their geographical observations, we commenced the descent shortly before noon. During the day I felt very unwell; and as soon as we had returned to our camping-place, and I had put my plants in paper, I was obliged to go to bed. On Christmas Day I was worse, and quite unable to do anything. Mr. Saker left us on that day, promising to return in eight or ten days. On the 27th, Consul Burton and Signor Calvo left in search of a suitable place where water might be provided for an excursion to the summit. When they returned in the evening, I learned that Consul Burton had found time to ascend Mount Victoria; he had unfortunately, however, so injured his foot that he was prevented leaving our encampment for the next four weeks. Until the 30th I was equally unable to move; but on that day I took a stroll, which I repeated on the two following days.

On the 2nd of January, 1862, I felt so well that I set out with Signor Calvo on my first excursion to the summit. We reached Mount Helen shortly after noon, and, after a short rest, directed our steps towards the next high mountain, named by Consul Burton "Mount Isabel." This we reached about 2 P.M.; and while our people prepared a sleeping-place in the crater, we set off to the summit, whence we enjoyed a magnificent view over that part of the range which we had just passed, while in the opposite direction rose Mounts Victoria and Albert, with a number of small hills in front, the formation of which must be ascribed to an earlier period, as the lava-field which surrounded them was formed by eruption from Mount Victoria and Mount Albert. The highest peak of the smaller hills I took the liberty of naming Mount Hooker. On the field which we traversed this day, the few plants which might be termed arborescent were *Leucothoë angustifolia* and *Myrica salicifolia*, Hochst., which reached a height of 20 feet, but only grew scattered in hollows or craters. *Hypericum angustifolium* only occurred as a shrub, not above 6 or 8 feet high. *Cytisus Mannii* was in full splendour, quite covered with flowers, and formed very pretty little trees with round tops. *Helichrysum fœtidum* grew in every direction, and *H. Hochstetteri* peeped out of all the hollows, while *Wahlenbergiæ* rose everywhere above the surface of the grass. *Scabiosa succisa* was here only found on the west side of Mount Isabel. Another small plant, *Umbilicus pendulinus*, grew on the lava-fields. On the following day we left the crater (alt. 10,746 ft.) at 7 A.M., and went round the west side of Mount Hooker; and on the north side, at its base, we found a suitable place to pass the next night. After an hour's rest, we climbed to the summit of Mount Albert, which we accomplished in less than four hours. This western side of the mountain was quite naked, consisting only of ashes, in which one frequently sank two steps backwards for one forwards. When we reached the summit (alt. by Consul Burton's thermometer 13,553 ft.), we found the wind so strong that it nearly blew us down, and at the same time it was so cold (45½°) that it made our tropical hands almost useless. After half-an-hour's stay, we hung up the self-registering thermometer and left the top, too much benumbed by cold for any further observations. We reached the rendezvous about 3 P.M.; but my collection this day was not very rich. Besides the Gramineæ, I found *Helichrysum Mannii*, the above-named Crassulacea, *Swertia Clarénciana*, and *Veronica Mannii*, which all grew on the enormous lava-fields which surround the highest mountain.

I felt very weak and unwell, and soon found that I had a relapse of my previous illness. This induced us, on the following day, to set out on our return. When we reached Mount Isabel, we perceived, on the opposite side of the crater, a native, destitute of clothing, save a piece about the loins, accompanied by two dogs with wooden bells fastened to their necks. I made signs to him to approach us; but this he declined, and soon made off. With the exception of one, our Kroomen were so frightened at his appearance that they took to their heels.

We reached our encampment at 5.30 P.M., and on the following day were joined by Mr. Saker and Mr. Smith, also a missionary. My condition daily became worse, and it was impossible for me to collect. I lay nearly the whole day in my hammock, using every means at hand, but without success. While Consul Burton was prevented walking by his wounded foot, Messrs. Saker and Smith fell ill of fever; so that we were a pitiful company for mountain research.

On the 9th I concluded to turn back to Victoria, and on the following day was carried down by my men, as I was too weak to go on foot. Mr. Smith returned on the 15th, suffering much from fever; and on the following day, Mr. Saker, having been to the summit two days previously. On the morning of the 22nd we had a tornado; and when it had passed over, we observed snow on the north-east side of the mountain. Having re-established my health, I again left Victoria on the 24th, and reached the forest beyond Mapanya in the evening. Next day I climbed, for the third time, the lava-stream, and reached, early in the afternoon, Consul Burton's encampment, where I learned that on the previous day he had set out on an excursion. The following day he visited the hollows before mentioned; and on the 27th we climbed to the summit for the last time. After we had reached Mount

Isabel and had rested, Consul Burton climbed to the top and made his observations, while I completed a sketch and collected till 5 P.M. We slept in the crater of this mountain, and on the next day went to a small crater where Mr. Saker had previously had his resting-place. After enjoying ourselves a little, we went to the principal peak, and, when we had reached it, turned to the east in order to have a view in a north-east direction. On reaching the shoulder of the mountain, we again found ourselves upon an extended lava-field, with the crater of Mount Victoria straight before us. While I made a sketch of it, Consul Burton went towards it; and I followed a little more to the eastward, where I, for the first time, saw the north-east direction of the range, which looked like a plain. When I reached the crater, I found it was much larger than any I had before seen, being considerably larger than that of the peak of Fernando Po. The absence of our people prevented Consul Burton from making the observations he intended. I found on the eastern side much more of interest than on the west, as it was more or less covered with vegetation to the top. I found, amongst other things, the pretty erect *Lycopodium*, No. 1410, of the collection, the very pretty Composite *Senecio Burtoni*, H. f., and *Anthospermum asperuloides*. *Helichrysum Mannii* grew everywhere at the bottom of the mountain, and on this side extended to the top. The *Ericinella* and the *Cytisus* both reach to the middle of the mountain. Mount Albert is, without doubt, of more recent formation than Mount Victoria, or it would be clothed with more luxuriant vegetation than the latter, as the wind is nearly always N.E., and I have always observed the vegetation to be far poorer on the side exposed to it. On the next day I visited this side again, and added some mosses to my collection, while Consul Burton visited the Prince's and Albert craters, and employed himself in measuring the distances. After I had again ascended Mount Victoria, and had made drawings of the two craters mentioned above, and of Mount Albert, I set off to the latter to fetch the thermometer; but to my sorrow I found it in 'a very different place to that in which I had left it, hanging only on one hook, and with the bulb uppermost, the spirit having changed from a red to a pale yellow colour. By this misfortune I lost the result of a month, and must be content with daily observation. After having rearranged it, and taken a good view of the unvisited mountain-chain to the north-east, I set off towards the crater, where I met Consul Burton, who had sent his servant to erect the British flag on Mount

Victoria. We then emptied a bottle of champagne in honour of the day, and again separated, I to descend to our resting-place, and Consul Burton to climb Mount Albert. When he returned, I learned that he had found crevices from which smoke was issuing. On the next day I again climbed Mount Victoria (alt. by Consul Burton's thermometer 13,270 ft.), and then went to Mount Albert and fetched the thermometer. I found the max. temp. 55°, the min. 27°, and the temperature, at the time of my return, 35°. I then visited the chinks to ascertain the temperature in them, which I found to be *lower* than outside: no smoke was issuing from them. From this I set out to Mount Hooker, at the base of which I boiled the thermometer (alt. 10,856 ft.), and then ascended and repeated the operation at the top (alt. 12,271 ft.), and returned.

While the north-east side of the latter mountain is covered with the very pretty grass *Deschampsia cæspitosa*, which forms masses of 2–3 feet diameter and 2 feet high, I found the south-west side entirely clothed with *Hypericum*, *Ericinella*, *Cytisus*, and *Helichrysum chrysocoma.*

On the way to Mount Isabel I was enveloped in such thick clouds that I could only see one or two steps in advance, which made the road, which in fine weather is difficult, very disagreeable, as one could not see the many holes until upon the margin of them. When I had reached Mount Isabel the weather cleared, and I set off to the principal encampment, where Consul Burton informed me that there had been a heavy shower of hail during the day; heavy rain had also fallen at the camp, and wetted most of the things we had left.

At noon on the 31st of January, Consul Burton and his people left for Victoria. The weather considerably improved; and a hurricane, which blew down some old trees near the camp, was the only noteworthy incident of the day.

On the following day I was busily engaged in collecting the pretty *Brucea antidysenterica*, sheltered in a hollow from the strong wind, when I suddenly observed a native close by, who, without seeing me, had unwittingly dropped upon me. When I addressed him, he stretched out his head, and after a few minutes pronounced the word "tobacco." I called to him to come nearer, which he was unwilling to do; and when I went towards him, I saw that he trembled with fright. He was a head taller than I, and nearly twice as stout, without any clothes except a small piece of thin cloth about his loins; he had a cutlass and other arms. I made him understand that he should bring me a hyæna and a gazelle, which he promised, and slowly went away, looking back as though afraid that I should lay hands upon him.

On the 2nd of February I left the camp early in the morning, went towards Mount Helen, made a sketch of Mount Isabel, and turned towards the eastern peak, Mount Eliza, which lies on the border of the ascending lava-field and the wood which reaches to the sea. In fact, half of it is in the wood and half above it, while the southern part and the crater are covered with a thick growth of trees. From the top I had before me the most beautiful panorama which I had hitherto seen, beginning with Mount Victoria, and ending with the "Black Crater." I traced it on paper, noted the direction of the various mountains, and then set out on my return to the encampment, following a footpath which from the north-east side of the mountain runs north-west from Mount Eliza, west-south-west from Mount Helen, through Calvo's Crater to the west side of the mountain. From the depth to which the path is worn, it would seem that it must serve as a communication between the inhabitants of the west and those of the north-east side of the mountain, as the hunters who would visit the mountain by this path are very few.

When I approached the rendezvous in the evening, I saw the north side of the mountain on fire, which the high wind favoured and quickly spread over the mountain.

On the 13th I left the place, with my people, and reached the forest a little above Mapanya late in the evening (Ridge Camp, alt. 4284 ft.). I spent four days at this place, of which two, from the very heavy rain, were almost lost. On the 14th the thunder began at 5 A.M., and lasted till 4 P.M.; and in the middle of the day it was so dark that the screech-owls and large bats left their hiding-places, and announced their presence by their unpleasant cries. I, however, succeeded in collecting all the plants I wished, and among them a beautiful *Mussænda* and two species of *Oncoba*. On the afternoon of the 17th, when upon an excursion downwards, I met Mr. Smith and Mr. Pinnock, who had been good enough to come in case Botani should have any unfriendly intentions; they had, however, found him very well satisfied, and we passed Mapanya, the next day, without meeting with any disturbance, and reached Victoria in the afternoon.

After packing my plants, I left Victoria on the 24th, in company with Mr. and Mrs. Saker and Mr. Smith, in a boat of the mission, and reached the Cameroon river at 3 A.M. on the following morning, intending to return to Fernando Po by the next steamer.

I owe many thanks to Mr. and Mrs. Saker and Mr. Smith, who here, and especially in Victoria, have always assisted me with the greatest kindness and politeness, thus removing many of the disagreeables connected with the expedition.

In the trust that the result of this expedition may meet your approval, and that the flora of the mountains of west tropical Africa may thereby become known to science,

I have the honour to remain, &c., &c., &c.,
G. MANN.

Cameroons, February 27, 1862.

An Enumeration of the Species of *Acanthaceæ* from the Continent of Africa and the adjacent Islands. By THOMAS ANDERSON, M.D., F.L.S., Officiating Superintendent of the Royal Botanic Gardens, Calcutta.

[Read June 5, 1862.]

IN this enumeration, I have followed the classification I proposed in my monograph of the Cingalese species of Acanthaceæ, published in Thwaites's 'Enumeratio Plantarum Zeylaniæ.' The principal feature of that arrangement is the subdivision of the Order into two great Suborders, *Ruellideæ* and *Acanthideæ*, distinguished from each other by the character of the æstivation of the corolline lobes, and into a third small but well-marked group, separated from the other two by the nature of the calyx, and also by the peculiar placental processes of the seeds. I shall reserve some remarks on the limits of the genera and the geographical distribution of the African species for the general revision of the Order, which I hope to submit to the Society at an early date.

CONSPECTUS GENERUM.

Subordo I. THUNBERGIDEÆ.

Calyx ad annulum carnosum, integrum vel pluridentatum reductus. Corollæ lobi æstivatione contorti. Semina cupula suffulta.—Plantæ volubiles, raro prostratæ.

1. THUNBERGIA. *Calyx* inconspicuus, bracteis duabus magnis occultus.

Subordo II. RUELLIDEÆ.

Calyx herbaceus, 5-, *raro* 4-*partitus. Corollæ lobi æstivatione contorti. Semina retinaculo uncinato* (*vel papilla*) *suffulta.—Plantæ non volubiles.*

Tribus I. Nelsoniæ.

Calyx parvus, herbaceus. Semina minuta, globosa, papilla parva suffulta.—Herbæ neglectæ.

† *Corolla infundibuliformis.*

2. Elytraria. *Stamina* antherifera 2; sterilia 2.—*Herbæ* acaules. *Scapi* folia squamæformia, adpressa.

3. Nelsonia. *Stamina* 2, sterilia nulla.—*Herbæ* caulescentes.

†† *Corolla* 2-*labiata.*

4. Adenosma. *Stamina* 2, in specie Africana.

Tribus II. Ruellieæ.

Calyx parvus, herbaceus. Semina conspicua, compressa, retinaculo uncinato suffulta.

Subtribus I. Hygrophileæ.

Corolla 2-*labiata. Capsula polysperma, valvis striatis vel sulcatis.*

† *Capsula linearis, compressa, a basi ad apicem seminifera.—Flores laxe paniculati.*

5. Brillantaisia. *Stamina* fertilia 2.

6. Nomaphila. *Stamina* fertilia 4.

†† *Capsula teretiuscula vel oblonga, a basi ad apicem seminifera.—Flores verticillati.*

7. Hygrophila. *Antheræ* muticæ, ovatæ.

Subtribus II. Euruellieæ.

Calyx herbaceus. Corolla infundibuliformis. Capsula basi sterilis, supra medium seminifera.

† *Bracteæ minutæ vel nullæ. Capsula subteres.*

8. Calophanes. *Corolla* recta. *Antheræ* basi 2-calcaratæ. *Capsula* linearis, acuta, apice 4-sperma.

9. Ruellia. *Corolla* recta vel curvata. *Antheræ* muticæ. *Capsula* apice tumida, subglobosa, polysperma.

†† *Bracteæ* 2, *magnæ, corollam tegentes. Capsula obovata, basi breviter constricta, a dorso compressa.*

10. Petalidium. *Bracteæ* membranaceæ. *Calyx* 5-partitus. *Corolla* in æstivatione bracteis 2 magnis occulta. *Flores* solitarii.

11. Pseudobarleria. *Bracteæ* subherbaceæ. *Calyx* 4-partitus. *Flores* in cymulis lateralibus.

††† *Bractea* 1 *magna ; bracteolæ* 2, *breviores.*

12. Phaylopsis. *Calyx* inæqualiter 5-partitus. *Flores* dense spicati.

Tribus III. Trichantheræ.

Calyx amplus, coloratus vel membranaceus.

13. Whitfieldia. *Bracteæ, bracteolæ* et *calyx* colorata. *Corolla* infundibuliformis. *Ovarium* 4-ovulatum. *Semina* 4, magna, subdiscoidea ; retinaculis apice bidentatis.

Subordo III. ACANTHIDEÆ.

Calyx herbaceus, 5-, *raro* 4-*partitus. Corollæ lobi æstivatione imbricati vel imbricato-bilabiati. Semina retinaculo uncinato suffulta.*

Tribus I. Barlerieæ.

Corolla hypocraterimorpha vel infundibuliformis ; lobis in æstivatione imbricatis (in Lepidagathide *bilabiatis*).

Sect. 1. *Corollæ lobi æstivatione imbricati.*

† *Antheræ biloculares.*

14. Barleria. *Calyx* 4-partitus. *Corolla* regulariter infundibuliformis vel hypocraterimorpha. *Stamina* 2 vel 4 antherifera, cum 1 seu 3 sterilibus brevioribus.

15. Crabbea. *Calyx* 5-partitus. *Corolla* campanulata. *Stamina* 4. *Ovula* 4–8.

16. Lankesteria. *Calyx* 5-partitus. *Corolla* oblique hypocraterimorpha. *Ovula* 4.

†† *Antheræ uniloculares.*

17. Crossandra. *Calyx* 5-partitus. *Corolla* hypocraterimorpha.

Sect. 2. *Corollæ lobi æstivatione bilabiati.*

18. Lepidagathis. *Calyx* 5-partitus. *Stamina* 4; antheris bilocularibus.

Tribus II. Acantheæ.

Corolla unilabiata; lobis 3 vel 5, medio exteriore. Stamina 4; antheris unilocularibus.

† *Calyx cruciatim 4-partitus.*

19. Blepharis. *Corolla* tubo brevissimo. *Calyx* lacinia superiore integra 3-nervia, inferiore 2-nervia. *Capsula* valvis membranaceis.

20. Acanthopsis. *Corolla* tubo elongato. *Calyx* lacinia superiore obsolete 6-nervia, inferiore 6-nervia.

21. Acanthus. *Corolla* tubo brevissimo. *Calyx* lacinia superiore 4–plurinervia. *Capsula* valvis chartaceis.

†† *Calyx 5-partitus.*

22. Sclerochiton. *Calyx* scariosus, evenius. *Corolla* limbo 5-lobato.

Tribus III. Justicieæ.

Corolla bilabiata. Stamina fertilia 2, loculis plus minus superpositis.

Subtribus I. Eujusticieæ.

Corolla tubo non elongato, recto; labio inferiore trifido, lobo medio lateralibus majore; labio superiore brevissime bidentato. Stamina 2.

Sect. 1. *Calyx 5-fidus.*

† *Capsula dehiscens, simpliciter bivalvis.*

23. Duvernoia. *Corolla* labio superiore concavo, compresso, margine et apice incurvo, galeato; inferiore plano. *Stamina* exserta; antheris bilocularibus, muticis.

24. Justicia. *Corolla* labio superiore concavo, non galeato; inferiore convexo, rugoso. *Stamina* antheris bilocularibus, loculo inferiore calcarato.

25. Schwabea. *Corolla* labio superiore concavo; inferiore plano, basi gibbulis 2 notato. *Semina* abortu 2, orbiculata, barbata.

26. Monothecium. *Corolla* labio inferiore breviter trilobo, plano. *Stamina* antheris unilocularibus.

27. ECTEINANTHUS. *Corolla* labio superiore angusto, bidentato; inferiore convexo reticulato. *Stamina* antheris bilocularibus muticis; loculis subtransversim apice inserta.

†† *Capsula parietibus membranaceis, dehiscentia ruptis; placentis a valvis secedentibus.*

28. RUNGIA. *Corolla* labio inferiore biplicato. *Spica* quadrifariam dense bracteata.

Sect. 2. *Calyx 4-fidus.*

29. ANISOSTACHYA. *Calyx* bilabiatus; labiis bipartitis. *Corolla* labio superiore plano; inferiore convexo, medio venoso.

Subtribus II. DICLIPTEREÆ.

Corolla tubo elongato, recto vel resupinato; labio inferiore lobo medio maximo, lateralibus linearibus. Bracteæ, excl. Rhinacantho, *calyce multo majores.*

† *Corolla tubo resupinato.*

30. DICLIPTERA. *Capsula* abbreviata; placentis cum retinaculis in dehiscentia solubilibus.

31. PERISTROPHE. *Capsula* elongata; placentis valvis persistentibus.

†† *Corolla tubo recto.*

32. HYPOESTES. *Bracteæ* tetraphyllæ. *Calyx* laciniis coalitis. *Stamina* antheris bilocularibus. *Flores* in capitulis 3- vel unifloris.

33. RAMUSIA. *Stamina* inclusa; antheris unilocularibus. *Flores* non spicati.

34. BRACHYSTEPHANUS. *Stamina* exserta; antheris unilocularibus. *Flores* spicati.

35. RHINACANTHUS. *Calyx* 5-partitus. *Corolla* longe tubulosa; limbo bilabiato. *Stamina* antheris bilocularibus. *Flores* paniculati; bracteis parvis, subulatis.

Subtribus III. GRAPTOPHYLLEÆ.

Corolla tubo abbreviato, dilatato; labio inferiore lobis subæqualibus. Stamina 2 vel 4. Bracteæ parvæ vel nullæ.

† *Stamina 2.*

36. GRAPTOPHYLLUM. *Stamina* antheris bilocularibus. *Stylus* inclusus. *Bracteæ* minutæ. *Folia* variegata.

†† Stamina 4, 2 ananthera.

37. HAPLANTHERA. *Antheræ* uniloculares, basi mucronatæ. *Stylus* longus, exsertus. *Flores* axillares, solitarii. *Bracteæ* minutæ.

38. RUTTYA. *Antheræ* uniloculares, basi muticæ. *Flores* spicati.

Tribus IV. ASYSTASIEÆ.

Corolla infundibuliformis vel raro hypocraterimorpha, æstivatione bilabiata. Stamina 4, sæpe 2 sterilia vel ananthera.

Subtribus I. ERANTHEMEÆ.

Corolla hypocraterimorpha ; lobis subæqualibus.

39. ERANTHEMUM. *Stamina* 2, cum rudimentis 2 sterilium ; antheris bilocularibus, loculis plus minus divaricatis muticis.

Subtribus II. EUASYSTASIEÆ.

Corolla infundibuliformis ; lobis æqualibus.

40. DICENTRANTHERA. *Stamina* 4, didynama, omnia fertilia ; antheris loculis basi bicalcaratis.

41. ASYSTASIA. *Stamina* 4, omnia fertilia ; antheris loculis basi mucronatis.

42. MACKAYA. *Stamina* 4, 2 ananthera ; antheris loculis muticis.

I. THUNBERGIA, *Linn. fil.*

Sect. 1. *Calycis limbus truncatus.*

1. T. NATALENSIS, *Hook. Bot. Mag.* t. 5082.

Hab. Prope Maritzburg in Natal provincia Africæ austro-occidentalis, *Sanderson* ! *in herb. Hook. et herb. Harvey.*

2. T. CHRYSOPS, *Hook. Bot. Mag.* t. 4119 ; *N. ab E. in DC. Prod.* xi. p. 55.

Hab. Ad Sierra Leone, *Whitfield* ! *in herb. Hook.*

3. T. GERANIIFOLIA, *Benth. in Fl. Nigrit.* p. 475.

Hab. Ad Sierra Leone, *Vogel* ! *in herb. Hook.* ; *Wilford in herb. nostr.*

4. T. VOGELIANA, *Benth. l. c.* p. 476.

Hab. In insula Fernando Po, *Vogel* ! *in herb. Hook.*

5. T. ERECTA, *T. Anders.*—Meyenia erecta, *Benth. l. c.* p. 476.

Hab. Ad Cape Coast in Africa occidentali tropica, *Vogel* ! *in herb. Hook.*

Sect. 2. *Calycis limbus pluridentatus.*

6. T. CYNANCHIFOLIA, *Benth. l. c.* p. 475.
Hab. Ad ripas fluvii "Quorra," *Vogel! in herb. Hook.*

7. T. KIRKIANA, *T. Anders.* Scandens, strigoso-hirsuta; foliis lanceolatis, acutis, basi acute hastatis, integris, trinerviis, utrinque scabro-hirsutis; pedicellis axillaribus, unifloris; bracteis ovato-lanceolatis, longe acuminatis, plurinerviis; calyce 6–7-fido.
Hab. Prope "Satohi" in Africa orientali tropica, ad altitudinem 3000 ped., *Kirk!*
Suffrutex 1–2-pedalis. *Caules* lignosi, subteretes. *Rami* herbacei, angulati, volubiles. *Folia* 1–2 unc. longa, basi ½–1 unc. lata, valde et acute hastata, pilis strigosis hirsuta. *Pedicelli* plerumque folia superantes, erecti. *Bracteæ* fere 1 unc. longæ, herbaceæ, 5–6 nerviæ, extus strigoso-hirsutæ, intus glabræ. *Corollæ* tubus 1 unc. longus, incurvus; limbus amplus, profunde 5-fidus, lobis subæqualibus, rotundato-ovatis. *Corolla* pallide lutea, fauce purpurea.

This species resembles some of the hastate-leaved forms of *T. fragrans*, Roxb., but it is easily distinguished from them by its long-pointed bracts and 3-nerved leaves.

8. T. ALATA, *Bojer, in Hook. Exot. Fl.* t. 17; *N. ab E. in DC. l. c.* p. 58.
Hab. In oris Africæ orientalis ad lat. 5°–6° austr., *Forbes! in herb. Hook.*; in pratis humidis insularum Zanzibar et Tombæ in ora orientali Africæ, *Bojer! in herb. Hook.*

9. T. ANGULATA, *Hils. et Bojer in Hook. Exot. Fl.* t. 166 et 177. f. 3, 4, 5.
Hab. In Africa australi, *Drège! in herb. Hook. et Sonder*; in insula Madagascar, *Bojer! in herb. Hook.*
Distr. In India orientali, sed certe non spontanea.

10. T. LANCIFOLIA, *T. Anders.* Caule erecto, subtereti, bisulcato, striato; foliis sessilibus, lanceolatis, acuminatis, mucronulatis; pedicellis axillaribus, solitariis, unifloris; bracteis ovato-lanceolatis, acutis, reticulato-venosis; calyce carnoso, incrassato, limbo paucidentato, dentibus inæqualibus breviter subulatis; corolla recta, tubo abbreviato, fauce amplo, limbi lobis æqualibus; staminibus 4, didynamis, antheris bilocularibus, 2 basi et apice aristatis, 2 apice solum aristatis; stigmate infundibuliformi, trigono. Capsulam non vidi.
Hab. In arvis ad altitudinem 2500 ped., prope Tshinsunze in Africa orientali tropica, *J. Kirk!*
Herbacea, erecta vel subvolubilis. *Rami* striati. *Folia* sessilia, acuminata, 1–3 unc. longa, ¼–½ unc. lata. *Pedicelli* proanthesin plus minus deflexi, apice paulo incrassati, ½–1 unc. longi. *Bracteæ* coriaceæ. *Corolla* recta, ampla, 1¼ unc. longa, flava, fauce purpurea.

11. T. Drègeana, *N. ab E. DC., l. c.* p. 58.
Hab. Ad Uitenhage in promont. Bonæ Spei, *Drège*! *in herb. Hook., Sonder, et Harvey.*

12. T. atriplicifolia, *E. Meyer, in herb. Drège.*—T. Drègeana, *N. ab E. in herb. Hook.* partim.—T. aspera, *N. ab E., DC., l. c.* p. 56.
Hab. In promont. B. Spei, *Drège*! *in herb. cit.*; Port Natal, *Krauss in herb. Hook.*

13. T. neglecta, *Sond. in Linnæa,* xxiii. p. 89.—T. hirta, *Sond. l. c.* p. 88.—T. Drègeana, *N. ab E. in herb. Hook.* partim.
Hab. In promont. B. Spei, *Drège*!, *herb. Ecklon et Zeyher*!

14. T. Capensis, *Thunb. Prod. Fl. Cap.* p. 106.
Hab. In Africa australi, *Drège*! *Sanderson*! *in herb. Hook.*; *in herb. Ecklon et Zeyher*!

15. T. reticulata, *Hochst. in Schimp. Pl. Abyss.* n. 758; *DC. l. c.* p. 58.
Hab. In Abyssinia, *Schimper*!

16. T. annua, *Hochst. in Kotsch. Pl. Nub.* n. 109; *DC. l. c.* p. 55.
Hab. In Nubia et Abyssinia, *Kotschy*!

17. T. hirsuta, *T. Anders.* Subprostrata, hirsuta; foliis subsessilibus, triangularibus vel ovato-lanceolatis, basi rotundatis vel subcordatis, 5-nerviis, margine sinuato-dentatis; pedicellis erectis, axillaribus, elongatis, unifloris; bracteis reticulatis, ovato-lanceolatis, acutis, basi cordatis; calyce 12-fido; corollæ tubo basi constricto, superne ventricoso, multum incurvo.
Hab. In Abyssinia, *Plowden*! *in herb. Hook.*
Caules subprostrati, subteretes, pilis patentibus hirsuti. *Folia* 1–1½ unc. longa, 1 unc. lata, herbacea, hirsuta. *Pedicelli* 3 unc. longi, axillares, uniflori, hirsuti. *Bracteæ* 1¾ unc. longæ, ¾ unc. latæ, reticulato-nerviæ, extus submolliter tomentosæ, intus glabræ. *Corollæ* tubus 1½ unc. longus, basi constrictus, ad medium ventricosus, ad faucem paulo constrictus; limbus subcoriaceus, lobis parvis, subæqualibus. *Capsula* glabra.

II. Elytraria, *Vahl.*

1. E. crenata, *Vahl. En.* i. p. 106.—E. marginata, *Pal. de Beauv. in Vahl. En.* i. p. 108.—E. virgata, *N. ab. E., DC. Prod.* xi. p. 63.
Hab. In insula Fernando Po, *Vogel*! *Mann*! *in herb. Hook.*; insula St. Thomas, *Don*!; Tette et Senna prope flumen Zambese, *Kirk*!
Distr. In regionibus calidioribus Americæ borealis, atque in Asia tropica.

III. Nelsonia, *R. Br.*

1. N. tomentosa, *Willd. Sp. Pl.* ed. 2, p. 419.—N. rotundifolia, *R.Br. Prod. Fl. Nov. Holl.* i. p. 481.—N. nummulariæfolia, *Roem. et Sch.*

Syst. i. p. 173.—N. Pohlii, *N. ab E. in Endl. et Mart. Fl. Bras.* fasc. vii. p. 15.—N. canescens, *N. ab E., DC. Prod.* xi. p. 67.

Hab. In Africa tropica vulgatissima, *Vogel*! *Barter*! *Mann*! *et Kirk*! *in herb. Hook.*; in insula Madagascar, ad Warrow-voai Bombatooka, *Bojer*! *in herb. cit.*

Distr. Herba neglecta per totum orbem calidiorem.

IV. ADENOSMA, *N. ab E.*

1. A. AFRICANA, *T. Anders.* Foliis submersis pinnatifidis, superioribus petiolatis, obovato-spathulatis, integris; floribus in verticillis paucifloris; corolla calycis segmentis breviore, alba; staminibus 2; ovario multiovulato.

Hab. Prope "Nupe," ad ripas fluminis "Quorra," *Barter*! *in herb. Hook.*

V. BRILLANTAISIA, *Pal. de Beauv.*

1. B. OWARIENSIS, *Pal. de Beauv. Fl. Owar. et Ben.* ii. p. 68, t. 100. f. 2.—B. Lamium, *Benth. in Fl. Nigrit.* p. 477.—Belantheria Belvisiana, *N. ab E., DC. Prod.* xi. p. 97.—Leucoraphis Lamium, *N. ab E. l. c.*

Hab. In Sierra Leone, *Whitfield*!; in insula Fernando Po, *Vogel*! *Barter*! *Mann*! *in herb. Hook.*

2. B. PATULA, *T. Anders.* Caule erecto; foliis ovatis, acutis, in petiolo decurrentibus, serratis; floribus in ramulis distichis axillaribus, divaricatis, patulis; calycis laciniis capsulam fere æquantibus, apice obtusis, reflexis; capsula apice acuta.

Hab. In Congo, *Christian Smith*! *in herb. Hook. ex herb. R. Brown.*

Suffrutex erectus, glanduloso-tomentosus. *Caulis* tetragonus, sulcatus, ad nodos tumidus. *Ramuli* floriferi 6–8 unc. longi, laterales, multiflori, dichotome ramosi. *Calycis* laciniæ vix 1 unc. longæ, lineares, obtusæ, glanduloso-hirsutæ. *Capsula* 1 unc. longa, pilis glandulosis sparsissime obtecta, polysperma.

3. B. VOGELIANA, *Benth. in Fl. Nigrit.* p. 477.

Hab. In insula Fernando Po, *Vogel*! *in herb. Hook.*

VI. NOMAPHILA, *Blume.*

1. N. LÆVIS, *N. ab E. in DC. Prod.* xi. p. 85.

Hab. In Senegambia, *Heudelot*!; in locis paludosis prope "Nupe," in Africa occidentali tropica, *Barter*! *in herb. Hook.*

2. N. CILIATA, *T. Anders.* Caule erecto, 4-angulari, nodis incrassatis, fimbriato-ciliatis; foliis sessilibus, lanceolatis, basi cordatis, glabris, integris; cymis axillaribus, paucifloris, foliosis; pedicellis filiformibus, glanduloso-hirsutis; calycis laciniis glanduloso-tomentosis; corollæ tubo calyce multo breviore.

Hab. In Congo, *Smith*! *in herb. Hook.*

Herba pedalis, erecta, subglabra. *Folia* 1–1½ unc. longa, ½ unc. lata. *Calyx* 3 lin. longus. *Corolla* 4 lin. longa, purpurea. *Ovarium* multiovulatum.

3. N.? LYALLIANA, *T. Anders.*—Echinacanthus Lyallianus, *N. ab E.*, *DC. l. c.* p. 168.

Hab. In insula Madagascar, *Lyall*! *in herb. Hook.*

I have seen so imperfect a specimen of this plant that I am in doubt about the genus. It has certainly no affinities with *Echinacanthus*, from which the form of the capsule distinguishes it.

VII. HYGROPHILA, *R. Br.*

1. H. SENEGALENSIS, *T. Anders.*—Physichilus Senegalensis, *N. ab E.*, *DC. Prod.* xi. p. 81.

Hab. In Senegal et Senegambia, *Heudelot*! *in herb. Hook.* nn. 139 et 2838.

2. H. ODORA, *T. Anders.*—Polyechma odorum, *N. ab E. in DC. l. c.* p. 88.

Hab. In Senegambia, *Heudelot*, n. 807 *in herb. Hook.*!, *in herb. Mus. Paris.*

3. H. CÆRULEA, *T. Anders.*—Polyechma cæruleum, *Hochst. in Flor. Ratis.* 1841, i. p. 376.

Hab. In Nubia, ad ripas fluminis Nili, *Schimper*! *in herb. Hook.*

4. H. MICRANTHA, *T. Anders.*—Polyechma micranthum, *N. ab E. l. c.* p. 83.

Hab. In Senegal, *Perrottet*; ad Dagana in Senegambia, *Leprieur*! *in herb. Mus. Paris.*

5. H. ABYSSINICA, *T. Anders.*—Polyechma Abyssinicum, *Hochst. in Schimp. Pl. Abyss.*

Hab. In Abyssinia, *Schimper*; in regno Sennaar, *Kotschy*, n. 293!

6. H. BARBATA, *T. Anders.*—Physichilus barbatus, *N. ab E. l. c.* p. 82.

Hab. In Senegambia, *Heudelot*, n. 573 *in herb. Hook.*!

7. H. LUTEA, *T. Anders.* Erecta, scabra; caule obsolete tetragono, supra nodos tumido; foliis sessilibus, linearibus, acutis, integris, pilis rigidis asperis; floribus in verticillis axillaribus, densis, subglobosis; calycis laciniis longe lineari-subulatis, setis hyalinis ciliatis.

Hab. Ad ripas fluminis "Quorra," prope "Onitohe," *Barter*! *in herb. Hook.*

Annua?, 1–2-pedalis, pilis rigidis patentibus scabra, pauce foliata. *Folia* 2–5 unc. longa, ¼ unc. lata, linearia, acuta, basi attenuata, utrinque aspera. *Corolla* parva, lutea.

8. H. SPINOSA, *T. Anders. in Thwaites, Enum. Pl. Zeyl.* p. 225.—Asteracantha longifolia, *N. ab E. in DC. l. c.* p. 247, *cum syn.*—A. auriculata, *N. ab E. l. c.* p. 248.—A. macrantha, *Hochst. in Schimp. Pl.*

Abyss. n. 343.—Barleria macrantha, *R. Br. in Salt, Abyss. App.*—B. auriculata, *Schumach. Pl. Guin.* p. 285.

Hab. In paludibus locisque humidis per Africam tropicam, ad Lagos et Nupe, *Barter*!; in Senegambia, *Heudelot*!; Abyssinia, *Schimper*! *Plowden*!; Nubia, *Kotschy*!; oris Mozambique, *Forbes*! *in herb. Hook.*

Distr. Per Indiam orientalem et insulas.

VIII. CALOPHANES, *Don.*

1. C. RADICANS, *T. Anders.*—Ruellia radicans, *Hochst. in Schimp. Pl. Abyss.* nn. 17 et 177.—Dyschoriste radicans, *N. ab E. in DC. Prod.* xi. p. 106.

Hab. Prope Adoam in Abyssinia, *Schimper*! *in herb. Hook.*

2. C. MULTICAULIS, *T. Anders.*—Ruellia multicaulis, *Hochst. l. c.* n. 43.—Dipteracanthus dejectus, var. β, *N. ab E.* partim, *l. c.* p. 125.

Hab. In "Scholoda" monte Abyssiniæ, *Schimper*! *in herb. cit.*

3. C. PERROTTETII, *N. ab E. in DC. l. c.* p. 111.

Hab. Prope Fassokal in Nubia, ad lat. 11° bor., *Kotschy*! *in herb. Hook.*; ad ripas fluminis "Oti" dicti tributarii "Quorra," *Barter in herb. cit.*

4. C. NATALENSIS, *T. Anders.*—Linostylis ovata, *Sond. in Linnæa,* xxiii. p. 94.

Hab. Ad Port Natal in Africa australi, *Gueinzius*! *in herb. Sonder.*

5. C. HEUDELOTIANUS, *N. ab E. in DC. l. c.* p. 112.

Hab. In Senegambia, *Heudelot,* nn. 144 et 190 *in herb. Hook.*!

6. C. SIPHONANTHUS, *N. ab E. in DC. l. c.* p. 112.—Ruellia siphonantha, *Hils. et Bojer in herb. Hook.*

Hab. In versuris agrorum Emirnæ, provinciæ insulæ Madagascar, *Bojer*!

7. C. MAURITIANUS, *T. Anders.*—Justicia repens, *Neraud. in herb. Hook.*

Hab. In insula Mauritii, *Neraud.*! *in herb. cit.*

8. C. GRACILIS, *N. ab E. in DC. l. c.* p. 111.

Hab. In insula Madagascar, *Lyall*!

9. C. PERSOONII, *T. Anders.*—Chætacanthus Persoonii, *N. ab E. in Linnæa,* xv. p. 356.—C. glandulosus, *N. ab E. in DC. l.c.* p. 462. —Eranthemum obovatum, *E. Meyer. Cat. Pl. Drège.*

Hab. Africa australi, in collibus Kurrolike, *Burke*! *in herb. Hook.*; prope Uitenhage, *Drège*!

10. C. COSTATUS, *T. Anders.*—Chætacanthus costatus, *N. ab E. in DC. l. c.* p. 462.

Hab. In Africa australi, ad Macalisberg, *Burke*! *in herb. Hook.*

11. C. Burkei, *T. Anders.*—Chætacanthus Burchellii, *N. ab E. in DC. l. c.* p. 462.
Hab. Ad "Thaba Unce" in Africa australi, ad lat. 31° austr., *Burke*! *in herb. Hook.*

Nees von Esenbeck named this species after the traveller Burchell, who he supposed had collected it. This, however, was an error, as the plant has been found only by the collector Burke, whose name therefore it ought to bear.

12. C. setosus, *N. ab E. in DC. l. c.* p. 112.
Hab. Prope flumen Aapges, *Burchell*; ad Graham's Town in Africa australi, *in herb. Hook.*!

IX. Ruellia, *Linn.*

1. R. patula, *Jacq. Misc.* ii. p. 358.—Ruellia matutina, *Hochst. et Steud. Pl. Ægyp.* n. 874.—Dipteracanthus patulus, *N. ab E. in DC.* xi. p. 126.
Hab. In Sennaar, *Kotschy*, n. 119!; at Elephants' Bay in Benguela, *Curror*! *in herb. Hook.*
Distr. In Arabia felici! India orientali! Ceylania!

2. R. prostrata, *Poir. Enc. Méthod.* vi. p. 349.—Dipteracanthus prostratus, *N. ab E. in Wall. Pl. As. rar.* iii. p. 81.—D. dejectus, *N. ab E. l. c.* p. 82.
Hab. In monte "Meeramballa" dicto, atque inter Lupata et Sena, prope fluvium Zambesi, *Kirk*!
Distr. In India orientali! et Ceylania!

3. R. cyanea, *Bojer in herb. Hook.*—Dipteracanthus cyaneus, *N. ab E. in DC. l. c.* p. 121.
Hab. In insula Madagascar, ad ripas fluminis Chazok, *Bojer*, n. 120 *in herb. Hook.*!

4. R. monanthos, *Bojer in herb. Hook.*—Dipteracanthus monanthos, *N. ab E. in DC. l. c.* p. 125.
Hab. In regione centrali insulæ Madagascar, *Bojer*! *et Bouton*! *in herb. Hook.*

5. R. Currori, *T. Anders.* Suffruticosa; caule erecto, tomento minuto dense incano; foliis ovatis, cordatis, integris, pubescentibus; pedicellis axillaribus, solitariis, unifloris; calycis laciniis corollæ tubo dimidio brevioribus, glanduloso-pubescentibus, linearibus, acutis; corolla magna, tubo elongato, limbo infundibuliformi, lobis brevibus, æqualibus, rotundatis.
Hab. In Benguela, prope Elephants' Bay, *Curror*! n. 17 *in herb. Hook.*
Pedicelli 1 unc. longi. *Bracteæ* nullæ vel cito deciduæ. *Calyx* $\frac{1}{2}$–$\frac{3}{4}$ unc. longus. *Corolla* 3 unc. longa, extus subpubescens, cærulea?

6. R. Thunbergiæflora, *T. Anders.* Caule adscendente, inferne lignoso, tereti, supra nodos constricto, cortice cinereo, ruguloso, papillis asperis obtecto, superne herbaceo, 4-angulari, sulcato; foliis

valde petiolatis, ovato-lanceolatis, utrinque acutis, crenulato-serratis, paucinerviis, glabriusculis; floribus terminalibus, spicatis, spicis abbreviatis, paucifloris, bracteatis; calycis laciniis subæqualibus, lanceolatis, acutis, glabris; corollæ tubo calycem æquante, fauce inflato, incurvo, limbo amplo, lobis æqualibus, rotundatis, integris; ovarii loculis 14-spermis.

Hab. In insula Fernando Po, ad altitudinem 1300 ped., *Mann*! *in herb. Hook.*

Suffrutex 2–3-pedalis, erectus. *Folia* 3–4 unc. longa, 1–2 unc. lata; petiolus 1½ unc. longus, teres, subglaber. *Corolla* violacea, 2 unc. longa; limbus 2 unc. latus.

7. R. PILOSA, *Linn. Suppl.* p. 290.—Fabria rigida, *E. Meyer, in Cat. herb. Drèg.*—F. pilosa, *N. ab E. in DC. l. c.* p. 114, *cum syn.*

Hab. In Africa australi, ad Macalisberg, *Burke*! *in herb. Hook.*

8. R. OVATA, *Thunb. Fl. Capen. ed. Schult.* p. 480.—Fabria cordifolia, *N. ab E., DC. l. c.* p. 114, *cum syn.*

Hab. Ad Macalisberg, *Burke*! *in herb. cit.*

9. R. ZEYHERI, *T. Anders.*—Dipteracanthus Zeyheri, *Sond. in Linnæa*, xx. p. 90.

Hab. Prope fluvium "Buffalo-hunt" dictum, in Africa australi, *Zeyher*! *in herb. Sond.*

10. R. HUTTONII, *T. Anders.* Herbacea, erecta, pilis adpressis omnino strigosa; foliis petiolatis, ovatis, obtusis, integris; floribus axillaribus, sessilibus, solitariis vel geminis; corolla extus tomentosa, intus glabra, calyce dimidio longiore; capsula calyce breviore, glabra.

Hab. Ad "Howeson's Point,' in regione orientali Africæ australis, *Hutton*! *in herb. Coll. Trin. Dublin.*

Stephanophysum Baikiei, Bot. Mag. t. 5111, which was raised at Kew from plants said to have been sent from Western Africa, is *Siphonacanthus repens*, N. ab E. in Endl. et Mart. Fl. Bras. fasc. vii. p. 47 (*Stephanophysum repens*, mihi)—a species confined to Brazil. Some mistake must have occurred in recording the source from whence the plant at Kew was procured. It was probably sent from South America by Herbst, from whom a case was received at about the same time as one from Dr. Baikie, of the Niger Expedition.

X. PETALIDIUM, *N. ab E.*

1. P. LINIFOLIUM, *T. Anders.* Erectum, glabrum, ramis lignosis; foliis sessilibus, linearibus, acutis, uninerviis, glabris; pedicellis axillaribus, solitariis, unifloris; bracteis 2, concavo-ovatis, mucronatis, infra medium connatis, membranaceis, albis, nervis viridibus pulcherrime reticulatis; calycis laciniis lineari-lanceolatis, inæqualibus, extus glandu-

losis; corolla infundibuliformi, extus puberula, tubo brevi, limbo inæqualiter 5-lobo, lobo inferiore transversim corrugato.

Hab. In Damara Land, regione Africæ australis, *in herb. Coll. Trin. Dubl.*!

Suffrutex subvirgatus, glaber, bracteis pulcherrimis conspicuus. Folia 1–2 unc. longa, angustissima, coriacea. *Bracteæ* 1 unc. longæ, glabræ, corollæ tubum valvatim tegentes, persistentes. *Corolla* 1¾ unc. longa, recta; lobis patentibus; lobo inferiore corrugato, pilis reflexis sparse obtecto. *Ovarium* 4-ovulatum. *Capsulam* non vidi.

XI. PSEUDOBARLERIA, *T. Anders.*

Bracteæ 2, oppositæ, magnæ, calycem, corollam in æstivatione et capsulam tegentes. *Calyx* 4-partitus; lacinia superiore et inferiore majoribus; lateralibus minoribus, subulatis. *Corolla* infundibuliformis; tubo constricto, limbo longiore; limbo æqualiter 5-fido, lobis æqualibus, brevibus, æstivatione contortis. *Stamina* 4, inclusa; filamentis æqualibus, fauci insertis, per paria basi connatis; antheris bilocularibus, ovatis, sagittatis, basi breviter mucronatis. *Stylus* teres; stigmate subulato, basi breviter bilobato, paulo revoluto. *Capsula* ovata, acuta, a dorso compresso, verticaliter dehiscente, tetrasperma vel abortu disperma. *Semina* ovata, compressa, tomentosa, margine hyalina, in aqua mucilaginem emittentia.

1. P. HIRSUTA, *T. Anders.* Caule erecto, tetragono, hirsuto; foliis petiolatis, late ovatis, acutis, integris, hirsutis; floribus in cymis lateralibus paucifloris; bracteis ovatis, acutis, integris, pilosis; capsula compressa, glabra, fulva.

Hab. Ad oras occidentales Africæ australis extratropicæ, *Curror*! *in herb. Hook.*

Suffrutex? ramosus, pilis patentibus hirsutus. *Caulis* incrassatus. *Folia* cum petiolo 2½–3½ unc. longa, 1–1½ unc. lata. *Flores* in cymis 2-3 unc. longis cum foliis bractiformibus intermixti. *Bracteæ* 1 unc. longæ, pilosæ.

XII. PHAYLOPSIS, *Willd.*

1. P. PARVIFLORA, *Willd. Sp. Pl.* iii. p. 342.—Ætheilema reniforme, *N. ab E. in Wall. Pl. As. rar.* iii. p. 94, *et in DC. Prod.* xi. p. 261, *cum syn.*—Æ. imbricatum, *N. ab E. in herb. Hook.* partim.

Hab. In insula Madagascar, prope Boinatar Bay!; in Pemba insula juxta Zanzibar!; Senegambia, *in herb. Hook.*!

Distr. In India orientali! Ceylania!

2. P. LONGIFOLIA, *Sims, Bot. Mag.* t. 2433.—Ætheilema imbricatum, *R. Br. Prod.* p. 478.—Æ. anisophyllum, *Meyer, Cat. Pl. Drèg.*—Barleria inæqualis, *Hochst. in Schimp. Pl. Abyss.* n. 367.—Ruellia imbricata, *Forsk. Descr.* p. 113.

Hab. In insula Madagascar, *Bouton*! *Bojer*!; Abyssinia, prope "Dochlii," atque in monte "Scholoda," *Schimper*, nn. 367! et 505!; Africa australi, ad Port Natal, *Krauss*! *Sutherland*!

3. P. Barteri, *T. Anders.* Caule erecto, tetragono, pilis reflexis subscabro; foliis petiolatis, lanceolato-ovatis, basi attenuatis, æqualibus, supra papillis minutis crystallinis scabris, subtus glaucis, nerviis pilis adpressis asperis; floribus in spicis terminalibus vel axillaribus subsecundis; bracteis lanceolato-ovatis vel ovato-rotundatis, erectis, membranaceis; calycis laciniis inferioribus supra medium connatis, lateralibus 2, brevioribus, profunde divisis, superiore spathulata, ovata, acuta, omnibus enerviis, glanduloso-hirsutis.

Hab. Ad Onitohe et Nupe, prope fluvium Quorra, *Barter*! *in herb. Hook.*

Herba erecta. *Folia* 2–4½ unc. longa, 1–2 unc. lata, aspera; petiolo 1½ unc. longo. *Spicæ* 1–3 unc. longæ. *Corolla* ½ unc. longa. *Ovarium* apice hirsutum. *Capsula* ignota.

XIII. Whitfieldia, *Hook.*

1. W. lateritia, *Hook. Bot. Mag.* t. 4155.

Hab. In Sierra Leone, *Whitfield in herb. Hook., et v. v. cult.*

2. W. longifolia, *T. Anders.*—Ruellia longifolia, *Pal. de Beauv. Fl. Owar. et Ben.* i. p. 45, t. 26.—Dipteracanthus elongatus, *N. ab E. in DC. Prod.* xi. p. 140.

Hab. In regione Owariensi, ad grad. latit. 5° aust.; in insula Fernando Po, *Vogel*! *Barter*! et *Mann*! *in herb. Hook.*

XIV. Barleria, *Linn.*

1. B. bispinosa, *Vahl. Symb.* i. p. 46.—B. Hystrix β. oblongifolia, *N. ab E. in DC. Prod.* xi. p. 239.

Hab. In Abyssinia, prope Adoam, *Schimper*, n. 208!

Distr. In Arabia felici!

The East Indian species which Nees von Esenbeck considered identical with Vahl's *Barleria bispinosa* is quite distinct from the Abyssinian specimens, which are certainly Vahl's plant. The East Indian species has greater affinities with *B. buxifolia*, Linn., than with *B. bispinosa*, Vahl. As I consider the East Indian and Ceylon plants, named by Nees von Esenbeck *B. bispinosa* and *B. spina Ceylanica*, to be one species, I propose to adopt the latter specific name, while I retain *B. bispinosa*, Vahl, for the Abyssinian and Arabian plant.

2. B. acanthoides, *Vahl. Symb.* i. p. 47.—B. triacantha, *Hochst. in Schimp. Pl. Abyss.* n. 1004.—B. candida, *N. ab E. in DC. l. c.* p. 240.—B. eranthemoides, *R. Br.*

Hab. In Abyssinia, prope Adegannam et fluvium Tacaz, *Schimp.* nn. 1004! et 1856!; Nubia et regno Kordofan, *Kotschy*!

Distr. In Arabia felici! Muscat! Scinde!

3. B. Prionitis, *Linn. Sp. Pl.* 887.—B. Hystrix, *Linn. Mant.* p. 89.—B. diacantha, *Hochst. in Schimp. Pl. Abyss.* n. 1008 et 1922.—B. hypocrateriformis, *Hochst. l. c.* n. 2194.—B. brevispina, *R. Br. in Salt. Abyss. App.*
Hab. In Abyssinia, prope Adegannam atque in montibus prope Dochadsa, ad altitudinem 5000 ped.; in insula Mauritio vix spontanea, sed ab India orientali introducta.

4. B. stimulans, *E. Mey. in Cat. Pl. Drèg.*; *N. ab E. in DC. l. c.* p. 241.
Hab. In Africa australi, ad fluvium "Gamka," *Burke*! *in herb. Hook.*; *Drège*! *in herb. Sond.*

5. B. irritans, *N. ab E. DC. l. c.* p. 236.—B. pungens, *Thunb. Fl. Cap., ed. Schult.* p. 458.
Hab. In Africa australi, ad Uitenhage, *Drège*! *Zeyher*!

6. B. ilicina, *E. Mey. MSS.* (absque descriptione). Erecta, glabra, caule tereti; foliis breviter petiolatis, ovatis, apice spinosis, margine spinoso-dentatis; bracteis simplicibus, rigidis, apice et margine spinosis; calycis laciniis exterioribus ovatis, margine longe spinoso-dentatis, membranaceis, glabris, reticulatis, interioribus lanceolatis, spinosis, uninerviis. Corollam et capsulam non vidi.
Hab. In locis rupestribus ad fluvium Garip in Africa australi, *Drège*! *in herb. Sond.*

7. B. pungens, *Linn. Suppl.* p. 290, et *N. ab E. DC. l. c.* p. 236.—Crabbea pungens, *Harv. Gen. South-Afric. Pl.* 276.
Hab. In Africa australi, ad Uitenhage, *Drège*! *in herb. Sond.*; Caffraria, *Brownlee*!; Grahamstown, *Bolton*!; Albany, *Williams*!

8. B. Meyeriana, *N. ab E., DC. l. c.* p. 230, *cum syn.*
Hab. Ad Port Natal in Africa australi, *Drège*! *Gueinzius*! *in herb. Hook.*

9. B. lancifolia, *T. Anders.* Erecta, pruinosa; foliis lineari-lanceolatis, acutis, integerrimis, mucronulatis; floribus sessilibus, axillaribus, solitariis; bracteis herbaceis, erectis, linearibus, calyce dimidio brevioribus; calycis laciniis herbaceis, integris, glandulosis, exterioribus ovatis vel ovato-lanceolatis, acutis, interioribus brevioribus, lanceolatis corolla infundibuliformi, tubo brevissimo, fauce dilatata, lobis late ovato-rotundatis; staminibus fertilibus 2, inclusis, filamentis basi connatis, anantheris 3 brevissimis; ovulis 4; capsula rostrata, glanduloso-tomentosa.
Hab. In Damara Land, regione Africæ austro-occidentalis, *in herb. Coll. Trin. Dubl.*
Suffrutex parvus. *Caulis* teres, cortice cinereo, pruinoso. *Folia* 1–2 unc. longa, juniora puberulo-glandulosa. *Bracteæ* 3 lin. longæ, angustissime lineares. *Calycis* laciniæ exteriores 3–6 lin. longæ. *Corolla* 1½ unc. longa, pulchra, limbo amplo, lobis patentibus.

10. B. DAMARENSIS, *T. Anders.* Erecta, pubescens; foliis petiolatis, ovatis, acutis, mucronatis, integris, puberulis; bracteis late subulatis, mucronatis; calycis laciniis lanceolatis, mucronulatis, integris, puberulis; exterioribus 5–7-nerviis; interioribus paulo brevioribus, glandulosis, uninerviis; corolla subhypocraterimorpha, extus puberula, tubo æquali, calyce duplo longiore, lobis ovatis patentibus; staminibus fertilibus 2, exsertis, sterilibus 2, alteris multo brevioribus.

Hab. In Damara Land, *herb. Coll. Trin. Dubl.*

The character of the outer segments of the calyx, the form of the corolla (especially of the tube) and the exserted stamens, sufficiently distinguish this species from its allies *B. Meyeriana* and *lancifolia.*

11. B. HOCHSTETTERI, *N. ab E. in DC. l. c.* p. 231.—B. Aucheriana, *N. ab E. l. c.* p. 234.

Hab. In Nubia et regno Kordofan, *Kotschy,* n. 119!

Distr. In Arabia felici! Muscat! Scinde!

12. B. PARVIFLORA, *R. Br. in Salt. Abyss. Append.* (absque descriptione). Caule erecto, ramis teretibus, divaricatis, junioribus pilis adpressis incano tomentosis; foliis obtuse lanceolatis vel ovatis, basi cordatis, mucronulatis, integerrimis, glaucis; floribus axillaribus, pedicellatis, solitariis vel geminis; bracteis ovatis, acutis, concavis, carinatis, integris, herbaceis, uninerviis; calycis laciniis herbaceis, carinatis, exterioribus bracteis brevioribus, ovato-lanceolatis, acutis; interioribus subulatis, exterioribus brevioribus; corolla campanulato-infundibuliformi, glabra, limbi lobis obovato-rotundatis; staminibus fertilibus 2, inclusis, anantheris 3; capsula rostrata, disperma, fusca, glabra; seminibus tomentosis.—*B. cordifolia,* Hochst. in Schimp. Pl. Abyss.

Hab. In montibus prope Tazeroo, oppidum Abyssiniæ, ad altitudinem 3500 ped., *Schimp.* n. 2291!

Suffrutex erectus, 1–2-pedalis. *Rami* divaricati; vetustiores lignosi, cortice fusco vel glauco; juniores incano-tomentosi. *Folia* $\frac{1}{4}$–$1\frac{1}{2}$ unc. longa, 3 lin.–$\frac{3}{4}$ unc. lata. *Calyx* 3 lin. longus. *Corolla* $\frac{1}{2}$ unc. longa.

13. B. ORBICULARIS, *Hochst. l. c.* (absque descriptione). Erecta, ramosa; foliis petiolatis, ovatis, integerrimis, pilis strigosis pubescentibus; floribus pedicellatis, axillaribus, solitariis vel in cymulis axillaribus paucifloris confertis; bracteis parvis, herbaceis, obovato-spathulatis, integris; calycis laciniis exterioribus magnis, late rotundo-cordatis, subherbaceis, superiore apice breviter bimucronulata, inferiore integra, interioribus brevissimis, subulatis; corolla subinfundibuliformi, limbo breviter 5-lobo; staminibus fertilibus 2, inclusis; capsula rostrata, disperma, tomentosa.

Hab. Abyssinia, in montibus prope Tazeroo, ad altitudinem 3300 ped., *Schimper,* n. 2189!

Suffrutex 1–2-pedalis. *Rami* divaricati, teretes, pubescentes. *Folia* cum petiolo 1–2 unc. longa, $\frac{3}{4}$ unc. lata, herbacea. *Cymulæ* 3–5-floræ, axillares. *Bracteæ* $\frac{1}{2}$ unc. longæ. *Calycis* laciniæ exteriores 10 lin. longæ, 9 lin. latæ, virides, interiores 2 lin. longæ. *Corolla* parva, inconspicua, calyce plus minus occulta. *Capsula* 5 lin. longa, fulva, tomentosa. *Semina* ovata, compressa; testa carnosa.

14. B. VENTRICOSA, *Hochst. l. c.* et *N. ab E. in DC. l. c.* p. 230.
Hab. In dumetis partis inferioris "Scholoda" montis Abyssinici, *Schimper*, nn. 42! 1903!

15. B. GRANDIFOLIA, *R. Br. Salt. Abyss. Append.*—B. grandis, *Hochst.* et *N. ab E., DC. l. c.* p. 233.
Hab. In monte Sinai, prope Adoam oppidum Abyssinicum, *Schimper*, n. 702!

16. B. KIRKII, *T. Anders.* Tomentosa; caule obsolete tetragono; foliis ovatis, lanceolatis, acutis, integerrimis, pilosis; floribus in cymulis brevissimis axillaribus, vel subsessilibus solitariis; calyce reticulato-membranaceo, pubescente, laciniis exterioribus oblongis, apice mucronatis, margine acute dentatis subspinosis, interioribus minoribus subulato-lanceolatis; capsula subovata, brevissime rostrata, nigra, nitida. Corollam non vidi.
Hab. Ad Kaurabassa, prope Tette, in Africa austro-orientali tropica, *Kirk*!
Planta subherbacea, pilis floccosis omnino tomentosa. *Folia* $\frac{1}{2}$–1 unc. longa, $\frac{1}{2}$ unc. lata, pilis floccosis et simplicibus utrinque obtecta. *Cymulæ* 3–4-floræ. *Flores* approximatæ. *Bracteæ* calyce breviores, rigidæ, acute spinosæ, superne canaliculatæ, tomentosæ. *Calycis* laciniæ exteriores 8 lin. longæ, varie 5–7-spinosodentatæ.

17. B. GUEINZII, *Sond. in Linn.* xxiii. p. 91.
Hab. In Africa australi, ad Natal, *Gueinzius*! *in herb. Sonder.*, *Sutherland*! *in herb. Hook.*

18. B. RUELLIOIDES, *T. Anders.* Inermis; caule subtetragono; foliis breviter petiolatis, ovatis, utrinque attenuatis, integris, superne glabris, subtus glaucis; bracteis minutis, herbaceis, subulatis; calycis laciniis exterioribus magnis, late ovatis, acutis, integris, pubescentibus, interioribus minutis subulatis; corolla infundibuliformi; capsula obovata, erostrata, mucronata, chartacea, glabra, fulva; seminibus 2, magnis, ovatis, fulvo-sericeis.
Hab. Nupe ad ripas fluminis "Quorra," *Barter*!
Subherbacea, 3-pedalis, erecta, pauce ramosa, partibus junioribus pilis strigosis pubescentibus. *Caulis* ad angulos pilis adpressis sparse obtectus. *Folia* 2–4 unc. longa, 8 lin.–1$\frac{3}{4}$ unc. lata, herbacea, paucinervia, ad nervos utrinque subaspera; petiolo 3–4 lin. longa. *Calycis* laciniæ exteriores 8 lin. longæ, 5 lin. latæ, ciliatæ. *Corolla* 1$\frac{1}{2}$ unc. longa, glabra, cærulea; lobis æqualibus. *Capsula* 5 lin. longa, 3 lin. lata, calyce occulta.

19. B. Boivinii, *T. Anders.* Erecta, ramosa; caule tetragono, sulcato, cortice glauco; foliis petiolatis, lanceolato-ovatis, acuminatis, integris, glabris; cymis terminalibus, paucifloris, abbreviatis; bracteis herbaceis, linearibus, acutis, calyce brevioribus; calyce subherbaceo, laciniis exterioribus oblongis obtusis, interioribus brevioribus, lineari-lanceolatis, tomentosis, margine ciliatis; corolla anguste infundibuliformi, profunde 5-lobata, extus pubescente, intus glabra; staminibus fertilibus 2, inclusis, sterilibus 3; capsula obovata, erostrata, mucronata, glabra, fusco-nigrescente, disperma.

Hab. In insula Madagascar, *Boivin*!

Suffrutex erectus, inermis, glaber, cortice glauco. *Folia* 2–3½ unc. longa, 1–½ lata, herbacea, glabra, subtus ad nervos pilis adpressis tomentosa. *Calyx* 5–6 lin. longus, 2–3 lin. latus, lacinia inferiore apice paulo bidentata. *Corolla* 2 lin. longa, cærulea; tubo elongato. *Stamina* sterilia brevissima.

20. B. repens, *N. ab E. in DC. l. c.* p. 230.

Hab. In insula Pemba, in locis humidis, *Bojer*?; in insula Raza, ad oras Africæ orientalis, *Forbes*! *in herb. Hook.*

21. B. obtusa, *N. ab. E. in Linn.* xv. p. 358, *et in DC. l. c.* p. 231.—B. diandra, *Schlechtend. in herb. Drèg.*—B. barbata, *E. Mey. in Pl. Drèg.*

Hab. Ad Uitenhage, *Drège*! *Harvey*!; Port Natal, *Grant*! *Burke*! *Plant*! *Sutherland*! *Sanderson*!

22. B. opaca, *N. ab E. in DC. l. c.* p. 230.

Hab. Ad Accra, in oris Africæ occidentalis tropicæ, *Don*!

23. B. Burkeana, *Sond. in Linn.* xxiii. p. 92.—B. Burchelliana *et* macrostegia, *N. ab E. in DC. l. c.* p. 235.

Hab. Prope flumen "Vet River" in Africa australi, *Burke*! *in herb. Hook.*

24. B. ovata, *Meyer, Cat. Pl. Drèg., N. ab E. l. c.* p. 230.

Hab. In territorio Cap. Bon. Spei, *Drège*! *in herb. Hook.*

25. B. papillosa, *T. Anders.* Erecta, spinosa; caule subtereti, glauco; foliis subsessilibus, ovatis, spinoso-dentatis, coriaceis, papillosis; floribus axillaribus solitariis atque in spicis terminalibus confertis; bracteis linearibus, spinosis, acutis, margine spinosis; calycis laciniis exterioribus magnis, ovatis, apice spinoso-mucronatis, margine spinoso-dentatis, reticulato-nervosis, glanduloso-pubescentibus, interioribus lineari-lanceolatis, mucronatis, uninerviis, exterioribus brevioribus; corolla subhypocraterimorpha, lobis obovatis, apice rotundatis; staminibus fertilibus 2, exsertis.

Hab. In Namaqualand, regione Africæ australis, *Wyley*! *in herb. Harvey.*

Suffrutex erectus. *Caulis* divaricatus, nodis approximatis. *Folia* 3 lin. longa, 1–2 lin. lata, crassa, coriacea, papillis obtusis utrinque obtecta.

Spicæ 2–3 unc. longæ. *Bracteæ* rigidæ et acute spinosæ, superne canaliculatæ, vetustiores albescentes. *Calycis* laciniæ exteriores 6 lin. longæ, 4–5 lin. latæ. *Corolla* 1 lin. longa, extus puberula, purpurea.

26. B. FLAVA, *Jacq. Eclog.* p. 67. t. 46; *N. ab E. l. c.* p. 224.—B. Senegalensis, *N. ab E. l. c.*

Hab. In Senegambia, ad ripas fluvii Rio Nunoz, *Heudelot*! n. 644 *in herb. Hook.*

For many years this species has been a favourite plant in our stoves, to which it was introduced from the Jardin des Plantes at Paris. It was always considered an Arabian plant,—an error which originated with Jacquin. Nees von Esenbeck, though he detected Jacquin's mistake, added to the confusion by quoting Equatorial America as the native country of *B. flava*. At the same time, he remarks that his *B. Senegalensis* is perhaps the origin of the cultivated plant. In this he is certainly correct; for, after a careful comparison of Heudelot's Senegal specimens with living and dried ones of the garden plant, I can find no difference between them. I have therefore united the two species, and adopted Jacquin's very appropriate specific name.

27. B. LUPULINA, *Lindl. Bot. Reg.* t. 1483, *N. ab E. l. c.* p. 237.—B. macrostachya, *Boj. Hort. Maurit.* p. 260.

Hab. In locis aridis in insula Madagascar, *Bojer*! *in herb. Hook.*

28. B. HALAMOIDES, *N. ab E. l. c.* p. 231.

Hab. In oris Africæ austro-occidentalis extratropicæ, *Curror*! *in herb. Hook.*

29. B. ACANTHOPHORA, *N. ab E. l. c.* p. 726.

Hab. Ad Mozambique, *Loureiro.*

XV. CRABBEA, *Harv.*

1. C. NANA, *N. ab E. in DC. Prod.* xi. p. 162, *cum syn.*—C. cirsoides, *N. ab E. l. c.* p. 163, *cum syn.*

Hab. In Africa australi ad "Seven Fountains," prope fluvium "Vaal," *Burke*! *in herb. Hook.*; *Drège*! *et Ecklon et Zeyher*!

2. C. HIRSUTA, *Harv. in Lond. Journ. of Bot.* i. p. 27, *N. ab E. l. c.*

Hab. Ad Port Natal in Africa australi, *in herb. Trin. Coll. Dubl.*

3. C. ANGUSTIFOLIA, *N. ab E. l. c.*

Hab. Ad Macalisberg in Africa australi, *Burke*! *in herb. Hook.*

XVI. LANKESTERIA, *Lindl.*

1. L. HISPIDA, *T. Anders.*—Eranthemum hispidum, *N. ab E. in DC. Prod.* xi. p. 456, *cum syn.*—Lankesteria parviflora *et* L. longiflora, *Lindl. Bot. Reg.* xxxii. t. 12.

Hab. In Sierra Leone, *Don*!, *Barter*! *in herb. Hook.*

2. L. ELEGANS, *T. Anders.*—Eranthemum elegans, *R. Br.*, *N. ab E. l. c.* p. 447, *cum syn.*
Hab. In sylvis prope Abeokuta, *Barter*! *in herb. Hook.*

XVII. CROSSANDRA, *Salisb.*

1. C. GUINEENSIS, *N. ab E.*, *DC. Prod.* xi. p. 281.
Hab. In oris Guineæ, *in herb. Hook.*!; in insula Fernando Po, *Mann*!

2. C. MADAGASCARIENSIS, *T. Anders.*—Polythrix Stenandrium, *N. ab E. l. c.* p. 286.
Hab. In montibus provinciæ Emiræ et in sylvis loci "Be' fourem" dicti insulæ Madagascar, *Bojer*! *in herb. Hook.*

3. C. FLAVA, *Hook. Bot. Mag.* t. 4710.
Hab. In insula Fernando Po in monte "Sugar-loaf" dicto, *Whitfield. V. cult.*

XVIII. LEPIDAGATHIS, *Willd.*

1. L. RADICALIS, *Hochst. in Schimp. Pl. Abyss.*; *N. ab E.*, *DC. Prod.* xi. p. 255.
Hab. In Abyssinia locis siccis calidis apricis prope Axum, n. 1525! et in rupibus schistosis prope Adoam, n. 1072, *Schimper*!

2. L. ANOBRYA, *N. ab E. l. c.*
Hab. In Senegambia, *Heudelot in herb. Hook.* n. 204!

3. L. HEUDELOTIANA, *N. ab E. l. c.* p. 254.
Hab. In Senegambia, ad fluvium Rio Nunoz, *Heudelot in herb. Hook.* n. 666!

4. L. MOLLIS, *T. Anders.* Erecta; caule tetragono, aspero; foliis sessilibus, lineari-lanceolatis, mucronulatis, superne scabris, subtus tomentosis, trinerviis; floribus in spicis radicalibus et caulinibus confertis; bracteis lanceolatis, acutis, breviter aristatis, membranaceis, tomentosis, ciliatis; calycis laciniis membranaceis, uninerviis, tomentosis, ciliatis, majoribus 2 lanceolatis, minoribus 3 linearibus; corolla bilabiata fauce setis deflexis clausa; staminibus 4, inclusis; filamentis æqualibus.
Hab. In collibus saxosis ad Nupe prope fluvium Quorra, *Barter*! *in herb. Hook.*
Suffruticulus basi lignosus. *Caules* a radice 2–3 vel plurimi, adscendentes, pedales. *Folia* 2–3½ unc. longa, 3 lin. lata, rigida. *Spicæ* ovatæ vel subglobosæ, fulvæ, pilis albo-sericeis tomentosæ; radicales plures, dense confertæ; caulinæ pauciores, laterales, non verticillatæ. *Corolla* ¾ unc. longa, flava, intus maculis fulvis notata.

5. L. TERMINALIS, *Hochst. in Schimp. Pl. Abyss.*; *N. ab E. l. c.* p. 251.
Hab. Ad rupes in locis siccis infra Sessaquilla in Abyssinia, *Schimper*, n. 815! et 1920! *in herb. Hook.*; e regno Fayzokl, *Kotschy*, n. 482!

6. L. CALYCINA, *Hochst. l. c.*; *N. ab E. l. c.* p. 252.
Hab. In Abyssinia, prope Tazeroo, alt. 3500 ped., *Schimper*, n. 2190!
Distr. In Scinde!

7. L. GLANDULOSA, *N. ab E. l. c.* p. 243.—Barleria glandulosa, *Hochst. in Schimp. Pl. Abyss.*
Hab. In Abyssinia ad montem Scholoda, *Schimper*, n. 44!

8. L. HYSSOPIFOLIA, *T. Anders.*—Teliostachya hyssopifolia, *Benth. in Fl. Nigrit.* p. 481.
Hab. Sierra Leone, *Don*!

9. L. LAGUROIDEA, *T. Anders.*—Teliostachya laguroidea, *N. ab E. l. c.* p. 264.
Hab. Accra in oris Africæ orientalis ad lat. bor. 5°, *Vogel*!; ad ripas fluvii "Oty" tributarii Quorra, *Barter*!

I have seen a species of *Lepidagathis* in the Kew Herbarium among a collection of plants made in Congo by Christian Smith. It is closely allied to the Asiatic species *L. fasciculata*, but the specimen is too imperfect for specific determination.

XIX. BLEPHARIS, *Juss.*

1. B. BOERHAAVIÆFOLIA, *Juss.*; *N. ab E., DC. Prod.* xi. p. 266, *cum syn.*
Hab. In Congo, *C. Smith*! in Senegambia, *Heudelot*! Abyssinia in monte Scholoda et montanis prope Axum, *Schimper*, nn. 247! 1492! 1895!; in Guinea, *Thonning*! *in herb. Sonder.*
Distr. India orientali, Ceylania et Java.

2. B. GUEINZII, *T. Anders.*—B. boerhaaviæfolia, var. micrantha, *Sond. in Linn.* xxiii. p. 92.
Hab. Ad Port Natal in Africa australi, *Gueinzius*! *in herb. Sonder.*

3. B. SATURIÆFOLIA, *Pers. Syn.* ii. p. 180; *N. ab E. l. c.* p. 265, *cum syn.*
Hab. In Africa australi extratropica ad fluvium "Vat" et Grahamstown, *Burke*!; ad Port Natal, *Krauss*!, *Drège*! *in herb. Hook. et Sond.*; ad fluvia "Aapges" et "Vat."

4. B. PUNGENS, *Klotzsch in Peters, Mossamb. Bot.* p. 211. Caule ramoso, tereti; foliis sessilibus, lineari-lanceolatis, apice acutissime acicularibus, margine spinoso-serratis, uninerviis, utrinque glanduloso-puberulis; floribus axillaribus, solitariis, sessilibus; bracteis lanceolatis, acutis, apice spinoso-serratis, 3-nerviis, pubescentibus; calycis laciniis pubescentibus, superiore inferiore paulo longiore.
Hab. In Africa orientali tropica ad fluvium Zambesi, *Kirk*!
Suffruticulus elegans, vix pedalis, ad basin lignosus. *Caulis* cortice cinereo, pubescente. *Calyx* profunde 4-partitus, lacinia superiore integra, 3-nervia; inferiore bidentata, 2-nervia; lateralibus subulatis,

integris, uninerviis. *Corolla* tubo brevi, limbo unilabiato, labio trifido, linea media callosa 3-nervia. *Stamina* 4, subæqualia. *Ovarium* biovulatum. *Capsula* glabra, subchartacea. *Semina* testa muricata.

5. B. ANGUSTA, *T. Anders.*—Acanthodium angustum, *N. ab E. l. c.* p. 273.
Hab. In Africa australi prope "Schoon strom," *Burke* ! *in herb. Hook.*; ad "Nonderfontzs," *Zeyher* !; Natal, *Owen* ! *in herb. Trin. Coll. Dubl.*

6. B. PROCUMBENS, *Pers. Synops.* ii. p. 180.—Acanthodium procumbens, *N. ab E. l. c.* p. 273, *cum syn.*—A. diversispinum, *N. ab E. l. c.* p. 275.
Hab. In Africa australi prope Uitenhage et in collibus juxta fluvium Zwartkop, *Drège* !, *Ecklon et Zeyher* !

7. B. FURCATA, *T. Anders.*—Acanthodium furcatum, *N. ab E. l. c.* p. 276, *cum syn.*—A. macrum, *N. ab E. l. c.*
Hab. In Africa australi ad Port Natal, *Sutherland* !; ad fluvium "Gamka," *Burke* ! Namaqualand, *Wyley* !; ad Springbok Kral, *Zeyher* ! *Drège et Ecklon in herb. Sonder* !

8. B. CAPENSIS, *Pers. Syn.* ii. p. 180.—Acanthodium Capense, *N. ab E. in Linn.* xv. p. 361, *et DC. l. c.* p. 276, *excl. var.* β. *et* δ.—Acanthus Capensis, *Linn.*, *Thunb. Fl. Cap.* ii. p. 455.
Hab. Per Africam australem extratropicam vulgatissima, *Drège* !, *Ecklon et Zeyher* !, *Sanderson* ! *in herb. Hook.*, *Trin. Coll. Dubl. et Sonder.*

9. B. HIRTINERVIA, *T. Anders.*—Acanthodium hirtinervium, *N. ab E. l. c.* p. 277.—A. Capense, var. β. et δ. villosum, *N. ab E.*, *DC. l. c.* p. 276.
Hab. Ad Uitenhage, *Drège* !; ad Fish River, *Burke* !; Somerset, *Bowker* ! *in herb. Hook.*

10. B. SQUARROSA, *T. Anders.*—Acanthodium squarrosum, *N. ab E. in DC. l. c.* p. 275.
Hab. In Africa australi ad fluvium "Kat" dictum, *Burke* ! *in herb. Hook.*; ad Grahamstown, *Bolton* !

11. B. CARDUIFOLIA, *T. Anders.*—Acanthodium carduifolium, *N. ab E. l. c.* p. 278, *cum syn.*—A. Hoffmannseggianum, *N. ab E. l. c.* p. 277.
Var. glabra, *T. Anders.*—Acanthodium glabrum, *N. ab E. l. c.* p. 278, *cum syn.*
Hab. In Africa australi ad Cannisberg; Namaqualand, *Drège* ! *in herb. Hook. et Sonder.*

12. B. SPATHULARIS, *T. Anders.*—Acanthodium spathulare, *N. ab E. l. c.* p. 277, *cum syn.*
Hab. In Namaqualand, *Drège* ! *in herb. Sonder.*

I have seen only a very imperfect specimen of this species.

13. B. GLAUCA, *T. Anders.*—Acanthodium glaucum, *N. ab E. l. c.* p. 277.
Hab. In montibus Namaqualand inter "Elephant River et Kaus," ad lat. 22° aust., *Drège*!

Both this and the preceding species very much resemble *B. carduifolia.*

14. B. GROSSA, *T. Anders.*—Acanthodium grossum, *N. ab E. l. c.* p. 274.
Hab. In oris Africæ austro-occidentalis versus tropicam, *Curror*! *in herb. Hook.*

15. B. LINARIÆFOLIA, *Pers. Synops.* ii. p. 180.—Acanthodium hirtum, *Hochst. in Kotsch. Pl. Nub.* n. 256; *N. ab E. l. c.* p. 274.
Hab. In Senegambia, *Heudelot*, n. 179! *in herb. Hook.*; prope Nupe ad ripas fluvii Quorra, *Barter*!

There is a *Blepharis* found in Scinde and the Punjab which is figured by Wight in the 'Icones,' t. 1535 & 1536, as *Acanthodium grossum*, N. ab E., while the specimens of it in the Kew Herbarium are referred by Planchon to *Acanthodium hirtum*, Hochst. The Scinde plant is quite distinct from both of these species, though it is nearly allied to the last one. In an Enumeration of East Indian Acanthaceæ which I am preparing in uniformity with Hooker and Thomson's Præcursores, I have adopted Stock's MS. name for this species, *B. Scindica.*

16. B. EDULIS, *Pers. Synops.* ii. p. 180.—Acanthodium spicatum, *Delil.*, *N. ab E. l. c.* p. 274, *cum syn.*—Acanthus tetragonus, *R. Br. in Salt. Abyss. Append.*
Hab. In Abyssinia, in convalle Dallub, *Roth*!; Nubia, *Kotschy*, n. 33!; Ægypto in deserto inter Suez et Cairo, *Madden*!
Distr. In Arabia petræa! et felici! Muscat! Beloochistan!

XX. ACANTHOPSIS, *Harv.*

1. A. HORRIDA, *N. ab E., DC. Prod.* xi. p. 278, *cum syn.*
Hab. In Africa australi, *Drège*! *in herb. Hook. et Trin. Coll. Dubl.*; *Ecklon et Zeyher*! *in herb. Sonder.*

2. A. DISPERMA, *Harvey in Hook. Journ. Bot.* i. p. 28; *N. ab E., DC. l. c. cum syn.*
Hab. In Africa australi ad fluvium "Garip" in regione "Little Namaqualand" dicta, *Drège*! *in herb. Hook. et Sonder.*

XXI. ACANTHUS, *Linn.*

1. A. ILICIFOLIUS, *Linn. Sp. Pl.* p. 639.—Dilicaria ilicifolia, *N. ab E., DC. l. c.* p. 268, *cum syn.*
Hab. Prope Uitenhage, *Wendemann*! *in herb. Sonder.*
Distr. Per totam Asiam tropicam in locis maritimis.

2. A. KIRKII, *T. Anders.* Caule tereti, glabro; foliis ovatis, acutis, basi in petiolum attenuatis et decurrentibus, integerrimis, glabris; spicis terminalibus, brevibus, bracteatis, bracteis magnis, concavis, late ovatis, obtusis, mucronulatis, nitidis, margine membranaceis; calycis laciniis lanceolatis, acutis, duriusculis, glabris; corollæ labio 5-lobo, lobis rotundatis; filamentis æqualibus, glabris; ovarii loculis biovulatis.

Hab. Ad altitudinem 2000 ped. in Moramballa montem Africæ orientalis tropicæ, *Kirk*!

Frutex subvolubilis, glaber, inermis. *Folia* herbacea, ovata, utrinque glabra, petiolata, cum petiolo 6–10 unc. longa, 3–4 unc. lata. *Flores* magnæ, glabræ, suaveolentes.

3. A. BARTERI, *T. Anders.* Caule lignoso, tereti; foliis petiolatis, ovatis, acuminatis, mucronatis, margine serrato-dentatis, spinosis, utrinque scabris; spicis terminalibus; bracteis lanceolatis, margine et apice longe spinosis; capsula magna, glabra, valvis subchartaceis.

Hab. Ad Onitshe in Africa tropica prope fluvium Quorra, *Barter*!

Suffrutex 3-pedalis. *Caulis* glaber. *Folia* cum petiolo 6–9 unc. longa, 3–4 unc. lata, superne scabra, subtus asperrima. *Spicæ* 5 unc. longæ. *Calycem corollam*que non vidi.

4. A. MONTANUS, *T. Anders.*—Cheilopsis montana, *N. ab E. l. c.* p. 272, *syn. exclus.*

Hab. In montibus insulæ Fernando Po, *Vogel*! *in herb. Hook.*

5. A. MOLLIS, *Linn. Sp. Pl. ed. Willd.* iii. p. 397; *N. ab E. l. c.* p. 270.

Hab. Ad oppidum "Algiers" in Africa boreali, *Jamin*! *in herb. Hook.*

Distr. In oris septentrionalibus maris Mediterranei atque in Europa australi.

6. A. ARBOREUS, *Forsk. Descr.* p. 115.—Cheilopsis arborea, *N. ab E. l. c.* p. 272.—C. polystachya, *Moq.-Tand. in Ann. Sc. Nat.* sér. 1. t. xxvii. p. 230; *N. ab E. l. c.* p. 273.

Hab. In regno Fayzokl, *Kotschy*, n. 489!; Abyssinia, *Plowden*! *in herb. Hook.*

XXII. SCLEROCHITON, *Harvey.*

1. S. HARVEYANUS, *N. ab E., DC. l. c.* p. 279.

Hab. Ad "Orange River" fluvium Africæ australis, *Burke*! *in herb. Hook.*; *Drège*! *in herb. Hook. et Sonder.*

2. S. VOGELII, *T. Anders.*—Isacanthus Vogelii, *N. ab E. l. c.*

Hab. Ad promontorium Palmas Africæ occidentalis, *Vogel*!, *Ansell*! *in herb. Hook.*

XXIII. DUVERNOIA, *E. Mey.*

1. D. ADHATODOIDES, *E. Mey. Pl. Cat. Drèg.*; *N. ab E., DC. Prod.* xi. p. 323.

Hab. In Africa australi in regione promontorii Bonæ Spei, *Drège*! *in herb. Hook. et Sonder.*

XXIV. JUSTICIA, *Linn.*

Sect. 1. BETONICA. *Floribus terminalibus axillaribusve, spicatis; bracteis imbricatis. Frutices vel suffrutices.*

† *Spicis terminalibus.*

1. J. SCHIMPERIANA, *T. Anders.*—Adhatoda Schimperiana, *Hochst. in Schimp. Pl. Abyss.*; *N. ab E., DC. Prod.* xi. p. 388, *cum syn.*

Hab. In Abyssinia ad montes prope Axum et in vallibus apricis prope Adoam, *Schimper*, nn. 27! et 1549!

2. J. BETONICA, *Linn.*—A. Betonica, *N. ab E. l. c.* p. 385.—A. variegata, *N. ab E. l. c. cum syn.*—A. lupulina, *N. ab E. l. c. cum syn.*—A. cheiranthifolia, *N. ab E. l. c.* p. 387.

Hab. In collibus siccis prope Dochli pagum "Sana" districtus Abyssiniæ, *Schimper*, n. 516!; in Africa australi ad fluvium Aapges et ad Macalisberg, *Burke*!; ad Port Natal, *Williamson*! *in herb. Hook.*

3. J. MACULATA, *T. Anders.* Caule scandente seu volubile; foliis petiolatis, ovatis, apice acutis vel acuminatis, integris, utrinque glabris; spicis in ramis terminalibus, brevibus; bracteis bracteolisque parvis, subulatis; calycis laciniis lanceolatis, bracteis longioribus extus glabriusculis, intus puberulis; corolla intus maculis purpureis dense notata, extus pubescente, tubo brevi, dilatato; staminibus exsertis, antheris loculo inferiore breviter calcarato; ovario styloque tomentosis.

Hab. In insula Fernando Po, *Mann*!

Frutex 10–15-pedalis, scandens. *Caulis* lignosus, teres, cortice rubescente. *Folia* 3–6 unc. longa, 2–3½ unc. lata, basi obtusa, subtus paucinervia; petiolus 1–2 unc. longus. *Spicæ* 3–4 unc. longæ, sublaxæ, pilis adpressis puberulæ. *Bracteæ* 2–3 lin. longæ. *Corolla* magna, 1 unc. longa, alba, maculis purpureis notata.

†† *Spicis axillaribus, oppositis.*

4. J. TRISTIS, *T. Anders.*—A. tristis, *N. ab E. l. c.* p. 404.

Hab. In insula Fernando Po, *Vogel*!, *Mann*!

Sect. 2. ROSTELLARIA. *Floribus terminalibus spicatis, vel axillaribus subsolitariis; bracteis ciliatis. Plantæ herbaceæ, plerumque neglectæ.*

† *Floribus terminalibus spicatis.*

5. J. NATALENSIS, *T. Anders.*—A. Natalensis, *N. ab E. l. c.* p. 391.

Hab. In Africa australi ad Port Natal, *Krauss*! *in herb. Hook., et Bentham, Sanderson*!, *Sutherland*!

6. J. PALUSTRIS, *T. Anders.*—A. palustris, *N. ab E. l. c.* p. 402, *cum syn.*—A. Kotschyi, *N. ab E. l. c.* p. 397, *cum syn.*

Hab. In regno Kordofan, *Kotschy*, n. 61!; Abyssinia, in agris otiosis prope Goelbb, ad altitudinem 4000 ped., *Schimper*, nn. 1211! et 2156!

7. J. MAJOR, *T. Anders.*—A. major, *N. ab E. l. c.* p. 397, *cum syn.*
Hab. In Abyssinia ad ripas fluvii Tacaze sub arborum umbra, *Schimper*, n. 1251!

8. J. MINOR, *T. Anders.*—A. minor, *N. ab E. l. c.* p. 400, *cum syn.*
Hab. In Abyssinia montibus prope Tazeroo, locis aridis, alt. 4000 ped., *Schimper*, n. 2296!

J. major and *J. minor* will probably prove to be states of one species.

9. J. PLICATA, *Vahl, En.* i. p. 157.—A. plicata, *N. ab E. l. c.* p. 401.
Hab. In Africa occidentali ad Cape Coast et ad ostium fluvii Quorra, *Vogel*!; in sylvis umbrosis prope Onitshe, *Barter*!; in insula Fernando Po, *Vogel*! *in herb. Hook.*

10. J. KIRKIANA, *T. Anders.* Caule erecto, subscabriusculo, dichotome ramoso, sulcato; foliis subsessilibus, longissime linearibus, acutis, basi attenuatis, integris, utrinque scabriusculis; floribus terminalibus, spicatis; bracteis linearibus, margine ciliatis; calycis laciniis parvis, subulatis, ciliatis; corolla extus puberula, tubo brevi, labio inferiore rotunde 3-lobato, superiore bidentato.
Hab. In collibus prope Tette ad ripas fluvii Zambesi, *Kirk*! *in herb. Hook.*
Planta herbacea, erecta. *Caulis* tetragonus. *Folia* angustissime linearia, uninervia, 3–5 unc. longa, 3–4 lin. lata. *Spicæ* pedunculatæ, 1–2 unc. longæ, confertæ. *Bracteæ* et *calyces* pilis albis glandulosis ciliati. *Corolla* vix 5 lin. longa, straminea?

11. J. FASCIATA, *E. Mey. Cat. Pl. Drèg.*—A. fasciata, *N. ab E. l. c.* p. 402.
Hab. In Africa australi, *Drège*! *in herb. Sonder.*; ad Port Natal, *Gueinzius*!

12. J. PETIOLARIS, *E. Mey. Cat. Pl. Drèg.*—A. petiolaris, *N. ab E. l. c.*
Hab. In Africa australi, *Drège*! *in herb. Sonder.*; ad Port Natal, *Gueinzius*!

13. J. BARTERI, *T. Anders.* Caule erecto, simplici, pubescente, tetragono, sulcato; foliis breviter petiolatis, lanceolatis, basi paulo attenuatis, integris, scabris; spicis ternis, terminalibus, pedunculatis, una majore centrali, duabus minoribus, a basi pedunculi majoris axillaribus; pedunculis apice incrassatis; bracteis lanceolatis, acutis, velutinis, margine breviter ciliatis; calycis laciniis subulatis, bracteis dimidio brevioribus.
Hab. Ad Onitshe prope ripas fluvii Quorra, *Barter*!
Planta herbacea, 3–4-pedalis. *Caulis* sulcatus. *Folia* 3–4 unc. longa, 1–1¼ unc. lata, subtus venosa, subglauca. *Spica* major 1½ unc. longa, pedunculo breviore. *Calycis* laciniæ non ciliatæ. *Corolla* extus villosa, cinerea, lineis notata; tubo brevi.

14. J. DEPAUPERATA, *T. Anders.* Caule subtereti, striato; foliis subsessilibus, lanceolatis, acuminatis, obsolete dentatis, supra scabris, subtus hirsutis; spicis terminalibus, longe pedunculatis, elongatis, basi laxis; bracteis lineari-lanceolatis, acutis, glabris, margine ciliatis.

Hab. Ad Onitshe in Africa occidentali tropica, *Barter*!

Herba debilis, 3-pedalis. *Caulis* pilis patentibus hirsutis inter nodos, elongatus. *Folia* remota, acute lanceolata, 1½–2 unc. longa. *Spicæ* 2–4 unc. longæ, pedunculum æquantes. *Corolla* pallide flava, *fide Barter.*

15. J. PROCUMBENS, *Linn. Fl. Zeyl.* p. 19.—Rostellularia procumbens, *N. ab E. l. c.* p. 371.—R. rotundifolia, *N. ab E. l. c.* p. 370.—R. Abyssinica, *Brongn. et N. ab E. l. c.* p. 372.—R. mollissima, *N. ab E. l. c.* p. 373.—R. crinita, *N. ab E. l. c.*—R. Royeniana, *N. ab E. l. c.*—R. simplex, *Wight, Icon.* t. 1542, *et forsan* R. glandulosa, *N. ab E. l. c.* p. 373.

Hab. In Abyssinia ad margines montis Scholoda, *Schimper*, n. 21!, atque in montibus umbrosis prope Axum, *in herb. Hook.*!

Distr. India orientalis, insul. Philipp.!, Java!, insula Timor et Nova Hollandia tropica!

16. J. TENELLA, *T. Anders.*—Rostellularia tenella *et* R. crenulata, *N. ab E. l. c.* p. 369.—R. parviflora, *Benth. Fl. Nigrit.* p. 481.

Hab. In Senegambia, n. 327! *in herb. Hook.*; ex insula St. Thomas, *Don*!; Princes Island in locis cultis, *Barter*!; in Provincia Emirna insulæ Madagascar, *Bojer*!, *Lyall*!

17. J. TRIFOLIOIDES, *T. Anders.*—Rostellularia reptans, *N. ab E. l. c.* p. 368.

Hab. In insulis Madagascar et Pemba, *Bojer*!

18. J. HAPLOSTACHYA, *T. Anders.*—Rostellularia haplostachya, *N. ab E. l. c.* p. 369.

Hab. In insula Madagascar, *Bojer*!

†† *Floribus axillaribus, sessilibus, solitariis, geminis vel ternis.*

19. J. NEGLECTA, *T. Anders.*—Adhatoda Rostellaria, *N. ab E. l. c.* p. 397, *cum syn. sed excl. var. β. cum syn.*

Hab. In Abyssinia, in dumetis parvis prope Adoam, *Schimper*, n. 106! *Plowden*!; ad Nupe prope fluvium Quorra, *Barter*!; Abeokuta, *Irving*!; ad fluvium Gambia, *Skues*!

The variety of this species, *β. humilis*, N. ab E. l. c., is a new species of *Asystasia*—*A. Schimperi*, mihi.

20. J. INSULARIS, *T. Anders.*—Adhatoda diffusa, *Benth. Fl. Nigrit.* p. 483.

Hab. In insula Fernando Po, *Vogel*!, *Mann*!

21. J. TUBULOSA, *E. Mey. Cat. Pl. Drèg.*—Adhatoda tubulosa, *N. ab E. l. c.* p. 392, *cum syn.*—A. leptantha, *N. ab E. l. c.* p. 390, *cum syn.*
Hab. In Africa australi, *Drège* ! *in herb. Hook. et herb. Sonder.; Ecklon et Zeyher* ! *in herb. Sonder.*

22. J. PROTRACTA, *T. Anders.*—Adhatoda protracta, *N. ab E. l. c.* p. 390, *cum syn.* (sed forsan excl. *J. Capense,* Thunb.); var. β. microphylla, *N. ab E.*
Hab. In Africa australi ad Uitenhage, *Ecklon et Zeyher* ! *Bowie* ! *in herb. Hook.*; ad Port Natal, *Krauss* !, *Gueinzius*; ad Howeson's Point, *in herb. Sonder.* ! Var. β. ad Port Natal, *Grant* !; ad Albany atque in regione "Ceded Territory" dicta, *Ecklon et Zeyher* ! *in herb. Sonder.*

23. J. CAPENSIS, *Thunb. Fl. Cap.* p. 478.—Adhatoda Capensis, *N. ab E. l. c.* p. 391, *cum syn.*
Hab. In Africa australi ad fluvium Zwartkop et ad Albany, *Ecklon et Zeyher* ! *in herb. Sonder.*

24. J. ROTUNDIFOLIA, *E. Mey. Cat. Pl. Drèg.*—Adhatoda rotundifolia, *N. ab E. l. c.* p. 391.
Hab. In Africa australi, *Drège* ! *in herb. Hook. et Sonder.*

25. J. HETEROCARPA, *T. Anders.* Erecta, caule tetragono, striato, hirsuto; foliis longe petiolatis, ovato-lanceolatis, hirtellis, subtus glaucis, margine integris; floribus minutis, axillaribus, sessilibus, bracteis parvis, subulatis, ciliatis; calycis laciniis subulatis, margine ciliatis; corolla calyce dimidio longiore, tenerrima; capsulis dimorphis, normali parva, compressa, glabra, tetrasperma, valvis dorso sulcatis, abnormali ovata, paulo compressa, indehiscente, 3–4-alatis, alis serrato-dentatis.
Hab. In rupibus umbrosis prope Tazeroo, oppidum Abyssiniæ, ad altitudinem 4000 ped., *Schimp.* ! n. 2300.
Distr. In Scinde !
Herba 6–3-uncialis. *Caulis* debilis, adscendens. *Semina* capsulæ normalis compressa, capsulæ cristatæ ovate subglobosa. Species ob capsulas dimorphas aliis speciebus generis distinctissima.

Sect. 3. GENDARUSSA. *Floribus paucis, axillaribus, pedunculatis vel solitariis bracteis minutis. Frutices vel plantæ lignosæ.*

26. J. HYSSOPIFOLIA, *Linn.*—Adhatoda hyssopifolia, *N. ab E. l. c.* p. 392.
Hab. In insula Teneriffæ, *Webb* ! insulis Canariis, *Bourgeau* !

27. J. CUNEATA, *Vahl, En. Pl.* i. p. 163.—Adhatoda cuneata, *N. ab E. l. c. cum syn.*—A. hyssopifolia, var. β. longibracteata, *N. ab E. l. c.*
Hab. In Africa australi, *Drège* ! *in herb. Hook.*; ad fluvium Zwartkop prope Uitenhage, *Ecklon et Zeyher* !; in solo indurato collium apricorum ad fluvium Zondag, *Bowie* ! *in herb. Hook.*

28. J. INCANA, *T. Anders.*—Adhatoda incana, *N. ab E. l. c.* p. 393, *cum syn.*

Hab. In Africa australi ad fluvium Bruck, *Burke*! *in herb. Hook.*

29. J. PATULA, *Lichtenst. in Roem. et Sch. Syst.* i. p. 164.—Adhatoda patula, *N. ab E. l. c.* p. 393.—A. pygmæa, *N. ab E. l. c.* p. 394.—A. diosmophylla, *N. ab E. l. c. cum syn.*

Hab. In Africa australi, *Drège*! *in herb. Hook.*; in fruticetis siccis in districtu Albany, *Bowie*!; ad fluvium Zwartkop, prope Uitenhage, *Ecklon et Zeyher*!

30. J. ORCHIDOIDES, *Linn. fil. Suppl.* p. 85.—Adhatoda orchidoides, *N. ab E. l. c.* p. 393, *cum syn.*, Gendarussa Linaria *excl.*

Hab. In Africa australi ad Kamaquas, *Ecklon et Zeyher*! *in herb. Drège.*

31. J. LINARIA, *T. Anders.*—Gendarussa Linaria, *N. ab E. in herb. Ecklon.*

Hab. In Africa australi, *Drège*!; ad Olifentsriver, *Ecklon et Zeyher*! *in herb. Sond.*

32. J. ANAGALLOIDES, *T. Anders.*—Adhatoda anagalloides, *N. ab E. l. c.* p. 403.—A. patula, *N. ab E.* partim, *in herb. Sond.*

Hab. In Africa australi ad fluvium Aapges, *Burke*!; ad Somerset, *Bowker*!; ad Uitenhage et Kamoo, *Ecklon et Zeyher*!

33. J. ODORA, *Vahl, En. Pl.* i. p. 164.—Adhatoda odora, *N. ab E. l. c.* p. 399, *cum syn.*

Hab. In montanis siccis prope "Mawer" pagum Abyssinicum, *Schimper*, n. 2135!

Distr. In Arabia felici!

34. J. ATHERSTONEI, *T. Anders.* Caule erecto, tereti, glanduloso-pubescente, ramis oppositis; foliis subsessilibus, oblanceolatis, apice acutis, integris, coriaceis, utrinque scabriusculo-glandulosis; floribus alternis, axillaribus, superioribus interdum oppositis, solitariis; bracteis parvis, lanceolatis; calycis laciniis lineari-lanceolatis, glandulosis; corolla calyce triplo longiore, tubo infundibuliformi; antheris loculo inferiore caudato; capsula apice subglobosa, abortu disperma.

Hab. In Namaqualand locis arenosis prope fluvium "An Aap River" dictum, tributarium fluminis "Orange River," *Atherstone*! *in herb. Trin. Coll. Dubl.*

35. J. MOLLIS, *E. Mey. Cat. Pl. Drèg.*—Adhatoda mollissima, *N. ab E. l. c.* p. 391.

Hab. In Africa australi, *Drège*!; ad Natovel, *Ecklon et Zeyher*! *in herb. Sond.*

36. J. DIVARICATA, *Willd. in herb. propr. et h. gen. Berol.* fol. 2 *et* 3. —Adhatoda divaricata, *N. ab E. l. c.* p. 391.

Hab. In Winterhoeksberg monte Africæ australis, *Ecklon et Zeyher*! *in herb. Sond.*

37. J. SPARTIOIDES, *T. Anders.* Caule tereti, glabro; ramis superioribus alternis; foliis paucissimis, linearibus, coriaceis, integris, uninerviis; floribus alternis, axillaribus, in infimis ramorum sessilibus; bracteis subulatis, calyce dimidio brevioribus; calycis laciniis anguste linearibus, glandulosis; corolla pubescente, tubo brevi, fauce inflata; antheris loculo inferiore calcarato.

Hab. In Namaqualand, *A. Wyley* ! *in herb. Trin. Coll. Dubl.*

Suffrutex virgatus, diffusus, fere subaphyllus, viridescens, partibus junioribus et calycibus glandulosis. *Folia* 3–8 lin. longa, ½–1 lin. lata. *Bractea* 1 lin. longa. *Corolla* 6–7 lin. longa. *Capsula* ignota.

38. J. SPERGULÆFOLIA, *T. Anders.* Caule subtetragono, sulcato, molliter pubescente, ramis oppositis; foliis sessilibus, linearibus, acutis, mucronulatis, basi attenuatis, glanduloso-pubescentibus; floribus axillaribus, sessilibus, solitariis, plerumque alternis; bracteis linearibus, pubescentibus, calycem paulo superantibus; calycis laciniis linearibus, acutis, corolla multo brevioribus; corolla labio inferiore oblongo, lobis ovatis, subæqualibus; capsula ovata, compressa, pubescente.

Hab. In Africa australi in Damara Land, *in herb. Trin. Coll. Dubl.* !

Planta subherbacea, velutino-pubescens. *Folia* ¾–1 unc. longa, integerrima. *Corolla* 4–5 lin. longa, extus puberula, intus glabra. *Capsula* 2 lin. longa, apice acuta, tetrasperma.

Sect. 4. MONECHMA. *Floribus in spicis axillaribus, oppositis; capsula abortu disperma.*

39. J. BLEPHAROSTEGIA, *E. Mey. Cat. Pl. Drèg.*—Monechma angustifolium, *N. ab E. l. c.* p. 412*.

Hab. In Africa australi, *Drège*! *in herb. Sond.*

40. J. DEBILIS, *Vahl, Symb. Bot.* i. p. 4.—Monechma debilis, *N. ab E. l. c.* p. 411, *cum syn.*—M. bracteatum, *Hochst.*, *N. ab E. l. c. cum syn.* —M. affine, *Hochst. in Flora*, 1843, p. 76, *et N. ab E. l. c.*

Hab. In Abyssinia prope Gapdia, *Schimper*, n. 759 !, ad pagum Kordofanum "Tejara" dictum; inter frutices in savannis, *Kotschy*, n. 261 !

Distr. In Arabia felici !

I have not seen *Monechma violaceum*, N. ab E. in DC. l. c. p. 411, from Abyssinia, and considered by Nees von Esenbeck to be the same as *Justicia violacea*, Vahl, Symb. Bot. i. p. 6. If they are identical, Vahl's name must be restored.

Sect. 5. RAPHIDOSPORA. *Floribus laxe paniculatis.*

41. J. LAXA, *T. Anders.*—Adhatoda paniculata, *Benth. Fl. Nigrit.* p. 482.

Hab. In insula Fernando Po, *Vogel* ! *Mann* !

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[*] The genus *Monechma* was constituted by Nees von Esenbeck to receive some 2-seeded species of *Justicia*. Though the capsules of these species have only 2 seeds, their ovaries contain 4 ovules; in every other character they are generically *Justiciæ*.

42. J. EXTENSA, *T. Anders.* Caule erecto, pubescente; foliis petiolatis, ovatis, acutis vel lanceolatis, integris, utrinque glabris, petiolo pubescente; paniculis terminalibus trichotome ramosis, laxis, ramis patentibus; bracteis parvis, subulatis; floribus remotis, subsecundis, alternis; calycis laciniis lanceolatis, acutis, pubescentibus; capsula pubescente, ad medium compressa, sterili, apice subglobosa, tetrasperma.

Hab. Ad Eppah in Africa occidentali tropica, *Barter*!

Suffrutex 7-pedalis. *Caulis* teres, lignosus, striatus. *Folia* 3–4 unc. longa, 1–2 unc. lata, paucinervia; petiolo 1½ unc. longo. *Paniculæ* elongatæ, laxæ, patentes, pubescentes, paucifloræ. *Calyx* 3 lin. longus. *Capsula* 1 unc. longa, adscendens.

43. J. CORDATA, *T. Anders.*—Leptostachya cordata, *N. ab E. l. c.* p. 378, *cum syn.*—Raphidospora cordata, *N. ab E. l. c.* p. 499.

Hab. In Abyssinia ad latus montium secus flumen Tacaze infra Selassaquillam, *Schimper*, n. 1250!

44. J. GLABRA, *Koenig*, var. PUBESCENS, *T. Anders.*—Raphidospora Abyssinica, *N. ab E. l. c.* p. 500, *cum syn.*

Hab. Abyssinia in arborum umbra vallis Tacaze, *Schimper*, n. 903!

Distr. In India orientali.

45. J. CAMPYLOSTEMON, *T. Anders.*—Leptostachya campylostemon, *N. ab E. l. c.* p. 378, *cum syn.*

Hab. In Africa australi, *Drège*!; ad Somerset, *Bowker*!

46. J. LEPTANTHA, *T. Anders.*—Raphidospora leptantha, *N. ab E. l. c.* p. 501.

Hab. In insula Madagascar, *Lyall*, n. 252! *in herb. Hook.*

JUSTICIÆ *incertæ sedis.*

47. J. ANSELLIANA, *T. Anders.*—Adhatoda Anselliana, *N. ab E. l. c.* p. 403.

Hab. In locis apertis ad Palmas promontorium Africæ occidentalis, *Ansell*!; ad Aboh, *Vogel*!

48. J. MANNII, *T. Anders.* Caule fruticoso, subtereti, supra nodos tumido, ramis divaricatis, lignosis; foliis ovatis, petiolatis, integris, apice acutis vel obtusis, utrinque glaberrimis, nervis paucis, crebris; floribus in spicis axillaribus? sessilibus, spicis laxis bracteis elongatis linearibus glabris; calycis laciniis bracteis brevioribus, æqualibus, ovato-lanceolatis; corolla pubescente, tubo elongato, basi angusto, limbo bilabiato, labio inferiore oblongo, fauce corrugata, segmentis ovatis, labio superiore acuto, breviter bidentato; staminibus corolla brevioribus, antherarum loculis muticis; ovario glabro, 4-ovulato.

Hab. In insula Fernando Po, *Mann*!

Frutex? glaber. *Caulis* lignosus; cortice plus minus rugoso. *Folia* 3–6 unc. longa, 1–3 lata; petiolo 1 unc. longo, superne sulcato. *Spicæ* 1 unc. longæ, laxæ, glabræ, paucifloræ. *Bracteæ* lineares, acutæ, 5 lin.

longæ, calyce duplo longiores. *Corolla* 1¼ unc. longa, extus pubescens, intus glabra, purpurea.

XXV. SCHWABEA, *Endl.*

1. S. CILIARIS, *N. ab E., DC. Prod.* xi. p. 384, *cum syn.*

Hab. In Senegambia, *Heudelot*!; Nubia, *Kotschy*!; Abyssinia, *Schimper*!

2. S. SPICIGERA, *N. ab E. l. c.*

Hab. In Senegambia, *Heudelot*, n. 167 ! *in herb. Hook.*

XXVI. MONOTHECIUM, *Hochst.*

1. M. GLANDULOSUM, *Hochst. in Schimp. Pl. Abyss.* n. 2274; *N. ab E., DC. Prod.* xi. p. 310, *cum syn.*—Rostellularia glandulosa, *N. ab E., DC. l. c.* p. 373.

Hab. In Abyssinia in præruptis umbrosis prope Mai Dogale, et in rupestribus herbosis monte Bellaka, alt. 6000 ped., *Schimper*, n. 617 ! et n. 2274 !

XXVII. ECTEINANTHUS, *T. Anders.**

Calyx 5-partitus; laciniis subæqualibus, ciliatis. *Corolla* bilabiata, labio superiore bidentato, subfornicato; labio inferiore convexo, trifido, transversim rugoso. *Stamina* duo; antherarum loculis uno super alterum posito, subtransversim apice connectivo insertis, ovalibus, muticis. *Stigma* integrum, acutum. *Capsula* ovata, basi sterilis, obliqua, tetrasperma. *Semina* ovata, compressa; testa rugosa.

1. E. DIVARICATUS, *T. Anders.*—Rhytiglossa ciliata, *N. ab E., DC. Prod.* xi. p. 335, *cum syn.*

Hab. In Africa australi, ad Uitenhage et Albany, *Ecklon et Zeyher* !; ad Port Natal, *Gueinzius* !

2. E. ORIGANOIDES, *T. Anders.*—Rhytiglossa origanoides, *N. ab E. l. c.* p. 336, *cum syn.*

Hab. In Africa australi, *Zeyher* ! *in herb. Hook.*

3. E. OVATUS, *T. Anders.*—Rhytiglossa ovata, *N. ab E. l. c. cum syn.*

Hab. In Africa australi, *Drège* ! *in herb. Sonder.*

4. E. PROLIXUS, *T. Anders.*—Rhytiglossa prolixa, *N. ab E. l. c. cum syn.*

Hab. Ad Port Natal, *Krauss* !; in Africa australi, *Drège* !

5. E. ECKLONIANUS, *T. Anders.*—Rhytiglossa Eckloniana, *N. ab E. l. c. cum syn.*

Hab. In sylvis Olifentshoek prope Uitenhage, *Ecklon et Zeyher* !, *Sparrman* ! *in herb. Sonder.*

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* I have constituted this genus from the African species of Nees von Esenbeck's genus *Rhytiglossa*, which is probably a strictly American genus. *Ecteinanthus* is intimately connected with *Justicia*, differing from it only in the shape of the anther-cells and the capsule.

XXVIII. Rungia, *N. ab E.*

1. R. grandis, *T. Anders.* Fruticosa, caule adscendente, subtereti, supra nodos tumido; foliis petiolatis, ovatis, acutis, integris, utrinque acuminatis; spicis terminalibus plerumque ternis, rarissime axillaribus, solitariis; bracteis ovatis, lanceolatis, vel parte herbacea lanceolata, acuta, margine membranaceo, crenato-corrugato; calycis laciniis lineari-lanceolatis, pubescentibus; corolla tubo brevi, labio inferiore breviter 3-lobo, centrali lateralibus latiore, labio superiore bidentato; capsula ovata, compressa, apice obtusa, pubescente, tetrasperma.

Hab. In Congo, *Chr. Smith*!; ad Eppah in Africa occidentali tropica, *Barter*!

Frutex 7–10-pedalis. *Caulis* cortice glabro. *Folia* magna, herbacea cum petiolo 4–8 unc. longa, 2–3 unc. lata, paucinervia. *Spicæ* 3–6 unc. longæ, bracteatæ, dense imbricatæ, pubescentes. *Bracteæ* 6 lin. longæ, 3 lin. latæ, portione herbacea lanceolata, plana, uninervia, margine membranaceo, transversim corrugato. *Bracteolæ* bracteis minores. *Corolla* alba. *Capsula* 5 lin. longa, 3 lin. lata.

2. R.? pubinervia, *T. Anders.* Caule erecto, fruticoso, dichotome ramoso, pubescente; foliis petiolatis, lanceolatis, acuminatis, basi attenuatis, integris, utrinque puberulis, subtus reticulato-venosis, nervis incano tomentosis; spicis axillaribus, oppositis, breviter pedunculatis; bracteis imbricatis, lanceolatis, margine membranaceo, angusto, plano, bracteolis lanceolatis, membranaceis, bracteis minoribus; calyce campanulato, ad medium bifido, lacinia superiore breviter bipartita, inferiore tripartita; staminibus inclusis; antheris bilocularibus, loculis linearibus, superiore sæpe sterili, inferiore calcarato; capsula ovata, mucronata, tetrasperma, valvis lignosis, dissepimento solubili; seminibus magnis, testa rugosula.

Hab. In Tohiradzovu monte prope fluvium Zambesi, *Kirk*!

Frutex 5-pedalis. *Caulis* lignosus, apice foliatus, supra nodos tumidus. *Folia* lanceolata, 3–7 unc. longa, 1–2 unc. lata, supra viridia, obscure nervia, subtus pallidiora, nervis pubescentibus. *Spicæ* numerosæ, laxæ, 1–2 unc. longæ. *Stylus* teres, pubescens; stigmate subulato, integro. *Capsula* 5–6 lin. longa, lignosa, glabra; valvis in dehiscentia ruptis. *Semina* subglobosa; retinaculis basi e latere compressis, apice subulatis. *Corollam* marcidam vidi.

XXIX. Anisostachya, *N. ab E.*

1. A. Bojeri, *N. ab E., DC. Prod.* xi. p. 368.

Hab. In insula Madagascar, *Bojer*!

2. A. velutina, *N. ab E. l. c.* p. 730.

Hab. In insula Madagascar, *in herb. Hook.*!

3. A. Commersoni, *T. Anders.* Caule lignoso, tereti, divaricato, glabro; foliis longe petiolatis, lanceolatis, vel ovato-lanceolatis, acuminatis, basi obliquis, integris, glabris; floribus in spicis axillaribus, spicis pedun-

culatis, geminis, una alteram superante foliis dimidio breviore, bracteis imbricatis, ovatis, obtusis, membranaceis; capsula parva, glabra.

Hab. In insula Joanna, *Commerson*! *in herb. Hook.*

Suffrutex glaber, nigrescens. *Folia* cum petiolo 3–5 unc. longa. *Spicæ* strobiliformes, glabræ; pedunculis ½–1 unc. longis, spica longioribus.

XXX. DICLIPTERA, *Juss.*

† *Floribus sessilibus, verticillatis.*

1. D. VERTICILLARIS, *Juss. in Mus. Ann.* ix. p. 268, *excl. syn. præter Lamarck.*—Justicia verticillaris, *Lam.*, *sed non Linn. fil. nec Vahl.*—D. maculata, var. β. Senegambica, *N. ab E.*, *DC. Prod.* xi. p. 485.

Hab. In insulis Capitis viridis, *Miller*!, *Darwin*!; in insulæ "Brava" arvis incultis, *Brunner*! *in herb. Hook.*; ad Lagos, *Barter*!

2. D. CLINOPODIA, *N. ab E.*, *DC. l. c.* p. 483, *cum syn.*

Hab. Ad promontorium Bon. Spei, *Drège*! *in herb. Hook. et Sond.*

3. D. MICRANTHES, *N. ab E.*, *Wall. Pl. As. rar.* iii. p. 112.—D. spinulosa, *Hochst. in Schimp. Pl. Abyss.* n. 509.—D. umbellata, *Juss. fid. Nees.*

Hab. In regno Fayzokl, *Kotschy*! *in herb. Hook.* n. 513; in montibus Abyssiniæ prope Dscheladscheranne, *Schimper*, n. 509!

Distr. In regionibus aridis Indiæ orientalis!

4. D. HETEROSTEGIA, *N. ab E. l. c.* p. 478.

Hab. In Africa australi, *Drège*; ad Port Natal, *Gueinzius*! *in herb. Sonder.*

†† *Floribus pedunculatis, axillaribus.*

5. D. LÆVIGATA, *Juss. in Ann. Mus. l. c.*; *N. ab E.*, *DC. l. c.* p. 476.

Hab. In insula Mauritii, *Bojer*!; in sylvis opacis montis Pouce, insula Mauritii, *Bouton*! *in herb. Hook.*

6. D. MADAGASCARIENSIS, *N. ab E.*, *DC. l. c.* p. 476.

Hab. In insula Madagascar, *Lyall*! *in herb. Hook.*

7. D. CAPENSIS, *N. ab E. in Linnæa*, xv. p. 373; *DC. l. c.* p. 481.—D. propinqua, *N. ab E. l. c.*; *DC. l. c.* p. 477.

Hab. In Africa australi prope Uitenhage, *Ecklon et Zeyher*! *in herb. Sond.*

8. D. MACULATA, *N. ab E.*, *DC. l. c.* p. 485, *cum syn. excl. var.* β. Senegambica.

Hab. In Abyssinia in præruptis rupium locis umbrosis prope Dscheladscheranne, *Schimper*, n. 701!, *Plowden*! *in herb. Hook.*

XXXI. PERISTROPHE, *N. ab E.*

1. P. BICALYCULATA, *N. ab E. in Wall. Pl. As. rar.* iii. p. 113; *DC. Prod.* xi. p. 496, *cum syn.*—P. Kotschyana, *N. ab E. l. c.* p. 497.

Hab. In Abyssinia ad latera montium calida prope Dscheladscheranne, *Schimper*, n. 694!; in vallibus districtus Haramat prope Geraz, *Schimper*, n. 1095!; in regno Kordofan, *Kotschy*, n. 50! *in herb. Hook.*; Senegambia, *Boteler*!; insulis Capitis viridis, *in herb. Hook.*; in Africa centrali ad urbem Kouka prope oras lacus "Tsad," *E. Vogel*!; Borgu, *Barter*!

Distr. In Arabia felici atque in India orientali vulgatissime.

2. P. CAULOPSILA, *N. ab E. l. c.* p. 498, *cum syn.*—P. cernua, *N. ab E. l. c. cum syn.*

Hab. In Africa australi, *Drège*!; in agris prope flumen Zwartkop, *Zeyher*! *in herb. Hook. et Sond.*; in districtu Uitenhage ad flumen Zemgagh, *Bowie*!, *Harvey*!, *Ecklon et Zeyher*!

3. P. NATALENSIS, *T. Anders.* Caule erecto, 5-angulari, ramis divaricatis; foliis petiolatis, ovato-lanceolatis, basi rotundatis, margine integris, utrinque tomentosis; floribus pedicellatis, bracteis parvis, subulatis, acutis; bracteolis 2, ad calycem adpressis; calycis laciniis æqualibus, lanceolatis, extus puberulis, intus glabris; corolla profunde bilabiata, labio inferiore ovato, subintegro.

Hab. Ad Port Natal, *Gueinzius*! *in herb. Hook. et Sonder.*; *Sanderson*! *in herb. Hook.*

Planta herbacea. *Caulis* angulatus, glaber, sed ad angulos subciliatus, supra nodos paulo tumidus. *Corolla* fere uncialis, extus pilis simplicibus sparse pubescens, in sicca purpurea.

XXXII. HYPOESTES, *R. Br.*

† *Floribus axillaribus, solitariis.*

1. H. UNIFLORA, *Hochst. in Schimp. Pl. Abyss.* n. 400.

Hab. Ad rupes calidas regionis inferioris in parte australi Scholoda montis Abyssinici, *Schimper*! *in herb. Hook.*

2. H. MACULOSA, *N. ab E., DC. Prod.* xi. p. 503, *cum syn.*

Hab. In insula Madagascar prope Tananarivou, *Bojer*!

3. H. HIRSUTA, *N. ab E. l. c.* p. 504.

Hab. In insula Madagascar, *in herb. Hook.*!

†† *Floribus in verticillis axillaribus.*

4. H. ARISTATA, *Soland. in Roem. et Sch. Syst.* i. p. 140; *N. ab E., DC. l. c.* p. 509, *cum syn.*

Hab. In Africa australi ad Uitenhage, *Drège*!, *Ecklon et Zeyher*!, *Forbes*!

††† *Floribus in spicis axillaribus, secundis.*

5. H. VERTICILLARIS, *Soland. in Roem. et Sch. Syst. l. c.*; *N. ab E., DC. l. c.* p. 507, *cum syn., forsan excl.* H. polymorpha, *Schlecht.*—H. clinopodia, *E. Mey. Cat. Pl. Drèg.*; *N. ab E., DC. l. c.* p. 508.

Hab. Prope Uitenhage, *Drège*! *Ecklon et Zeyher*!; ad Port Natal, *Gueinzius*! *R. W. Plant*, *Grant*!; Algoa Bay, *Forbes*!; ad "Vaal River," *Burke*!—Var. *glabra*, T. Anders., ad Somerset in Africa australi, *in herb. Hook.*!

6. H. MOLLIS, *T. Anders.* Caule subtereti, velutino; foliis longe petiolatis, ovatis, utrinque acuminatis, margine integris, supra subglabris, subtus tomentosis; spicis axillaribus, secundis, pilis patentibus pubescentibus; bracteis subulatis, tomentosis; calycis laciniis acutis, ciliatis; corolla parva, pubescente; capsula calyce duplo longiore, acuta, pubescente.

Hab. In Congo, *Chr. Smith*! *in herb. Hook.* (*olim in herb. cl. R. Brown*).

Herba erecta, molliter tomentosa. *Caulis* striatus. *Folia* 2 unc. longa, petiolum æquantia. *Spicæ* sessiles, axillares, oppositæ, et subterminales confertæ secundæ. *Calyx* 3–4 lin. longus. *Corolla* calyce duplo vel triplo longior.—Exemplum imperfectum ex herbario infelicis Chr. Smith vidi.

7. H. FORSKALEI, *R. Br. Prodr. Fl. Nov. Holl.* i. p. 474; *N. ab E., DC. l. c.* p. 507, *cum syn.*

Hab. In Abyssinia in monte Scholoda prope Adoam, *Schimper*, nn. 405! et 1861!

8. H. ROTHII, *T. Anders.* Caule subtetragono, glabro; foliis petiolatis, ovatis vel lanceolato-ovatis, acutis, margine sinuatis, supra glabris, subtus glabriusculis; spicis axillaribus subterminalibusque, paucifloris, tomentosis; bracteis in tubum coalitis, supra medium liberis; bracteolis bracteis inclusis parvis, subulatis, scariosis; calycis laciniis lanceolatis.

Hab. In Abyssinia ad Anhober, *Dr. Roth*! *in herb. Griffith*!, *Plowden*!

Planta herbacea, erecta. *Folia* 1–2 unc. longa, sæpe utrinque acuta. *Spicæ* folia subæquantes, secundæ. *Bracteæ* calyce bracteolisque multum longiores.

9. H. INSULARIS, *T. Anders.* Caule obtuse tetragono, striato, pubescente; foliis petiolatis, ovato-lanceolatis, utrinque acuminatis, supra ad nervos hirsutis, subtus pubescentibus, petiolis marginibusque ciliatis; spicis axillaribus, sessilibus, bracteis basi coalitis, lineari-lanceolatis, acutis, glabris, margine paulo ciliatis; bracteolis scariosis, subulatis, calyce dimidio brevioribus; calycis laciniis ad medium connatis, æqualibus, subulatis; corolla elongata, angusta, profunde bilabiata, extus hirsuta, intus glabra, labio inferiore ligulato, integro.

Hab. In insula Fernando Po, *Mann*! *in herb. Hook.*

Planta herbacea, pubescens. *Caulis* pubescens, angulis subciliatis. *Folia* integra, 4–5 unc. longa, 1–2 unc. lata. *Spicæ* petiolum æquantes. *Corolla* fere uncialis, purpurea.

10. H. BARTERI, *T. Anders.* Caule subtetragono, glabriusculo, ramoso; foliis longe petiolatis, ovatis, acutis, utrinque glabris, margine integris; spicis axillaribus, ramosis, pedunculatis vel sessilibus, solitariis vel 3–4 confertis; bracteis basi coalitis, linearibus, acutis, calyce longioribus; calycis laciniis parvis, subulatis, scariosis; corolla labio inferiore obovato, 3-dentato.

Hab. Ad Eppah prope flumen Quorra, *Barter*!

Suffrutex 4-pedalis, glaber. *Caulis* erectus, sulcatus, angulis obtusis.

Folia cum petiolo 6–7 unc. longa, 1–3 unc. lata. *Spicæ* laxæ, 2–7 unc. longæ, subsecundæ, glabræ. *Corolla* extus pubescens, lilacina.

11. H. LATIFOLIA, *Hochst. in Kotschy, Pl. Nub.* n. 296; *N. ab E., DC. l. c.* p. 509.
Hab. In Senegambia, *Heudelot*! n. 992? vel 972.

12. H. TRIFLORA, *Roem. et Sch. Syst.* i. p. 88; *DC. l. c.* p. 506, *sed excl. syn.*—H. acuminata, *Hochst. in Schimp. Pl. Abyss.* n. 1985.
Hab. Ad latus boreale montis Scholoda prope Adoam, *Schimp. Pl. Abyss.* n. 1985!

13. H. LASIOSTEGIA, *N. ab E., DC. l. c.* p. 504.
Hab. In insula Madagascar, *in herb. Hook.*!

14. H. SAXICOLA, *N. ab E., DC. l. c.* p. 503.
Hab. In interiore insulæ Madagascar, *Bojer*!

†††† *Floribus spicatis, terminalibus.*

15. H. GRACILIS, *N. ab E., DC. l. c.* p. 506.
Hab. In insula Madagascar, *Lyall*! *in herb. Hook.*

16. H. FLEXIBILIS, *N. ab E., DC. l. c.* p. 505.
Hab. In insula Madagascar, *Lyall*!

17. H. SPICATA, *N. ab E., DC. l. c.* p. 504.
Hab. In dumetis ad versuras agrorum provinciæ Emirnæ Madagascar, *Bojer, Lyall*!

18. H. FASCICULARIS, *N. ab E., DC. l. c.*
Hab. In silvaticis montosis provinciæ Emirnæ Madagascar, *Bojer*! *in herb. Hook.*

19. H. OXYSTEGIA, *N. ab E., DC. l. c.* p. 505.
Hab. In insula Madagascar, *Lyall*! *in herb. Hook.*

20. H. PULCHRA, *N. ab E., DC. l. c.*
Hab. In insula Madagascar, *in herb. Hook.*!

21. H. ANISOPHYLLA, *N. ab E., DC. l. c.* p. 503.
Hab. In insula Madagascar, *in herb. Hook.*!

22. H. BOJERIANA, *N. ab E., DC. l. c.* p. 506.
Hab. In silvis umbrosis secus rivulos provinciæ Emirnæ insulæ Madagascar, *Lyall*! *in herb. Hook.*

23. H. DICLIPTEROIDES, *N. ab E., DC. l. c.* p. 510.
Hab. In insula Madagascar, *Lyall*! *in herb. Hook.*

XXXIII. RAMUSIA, *N. ab E.*

1. R. TRIDENTATA, *N. ab E., DC. Prod.* xi. p. 309, *cum syn.*
Hab. In Africa australi ad Port Natal, *Gueinzius*! *Drège in herb. Sond.*! *et Hook.*!

XXXIV. BRACHYSTEPHANUS, *N. ab E.*

1. B. LYALLII, *N. ab E., DC. Prod.* xi. p. 511.
Hab. In insula Madagascar, *Lyall*! 249 *in herb. Hook.*

XXXV. RHINACANTHUS, *N. ab E.*

1. R. COMMUNIS, *N. ab E., DC. Prod.* xi. p. 442, *cum syn.*—R. osmospermus et R. Rottlerianus, *N. ab E. l. c.* p. 443.
Hab. In insula Madagascar ex regione interiore, *Bouton*!; in insula Mauritii sed certe non spontaneus, *in herb. Hook.*!
Distr. Suffrutex in hortis regionum tropicarum Asiæ cultus; forsan in sylvis montium Neilgherriensium et Javanicorum indigenus.

2. R. OBLONGUS, *N. ab E. l. c.* p. 444, *cum syn.*
Hab. In Chumi monte regionis Caffrorum, *Ecklon et Zeyher*!

XXXVI. GRAPTOPHYLLUM, *N. ab E.*

1. G. HORTENSE, *N. ab E. in Wall. Pl. As. rar.* iii. p. 285; *DC. Prod.* xi. p. 328.
Hab. In Sierra Leone, et insula Mauritii, in hortis cultum, *Barter*! *in herb. Hook. ex horto botanico Mauritii*!
Distr. Patria ignota, sed per totum orbem tropicum, ob flores speciosas foliaque variegata, introducta. In insulis Amicis (an indigena?), *Harvey*!

XXXVII. HAPLANTHERA, *Hochst.*

1. H. SPECIOSA, *Hochst. nov. gen. pl. Afric. in Flora*, 1843, p. 71; *N. ab E., DC. Prod.* xi. p. 308.
Hab. In Abyssinia secus ripas fluvii Tacaze, *Schimper*, n. 769!, *Plowden*! *in herb. Hook.*

XXXVIII. RUTTYA, *Harv.*

1. R. OVATA, *Harv. in Loud. Journ. of Bot.* i. p. 27; *N. ab E. in DC. Prod.* xi. p. 309, *cum var. et syn.*
Hab. In Africa australi ad Port Natal, *Gueinzius*! *Williamson*! *in herb. Hook., et Harvey*; *Drège*! *in herb. Sonder.*

XXXIX. ERANTHEMUM, *Linn.*

1. E. NIGRITIANUM, *T. Anders.* Caule erecto, tereti, subglabro; foliis petiolatis, ovato-lanceolatis, acuminatis, margine integris, utrinque glabris; spicis terminalibus vel subaxillaribus, dichotomis, parvifloris; calycis laciniis lanceolatis, subulatis, corolla capsulaque multo brevioribus; corolla hypocraterimorpha, limbi lobis subæqualibus; staminibus subinclusis, anantheris 2 brevioribus; capsula parte sterili elongata, acuta, glabra, valvis dorso sulcatis, in semina paulo constrictis.
Hab. In insula Fernando Po, *Mann*!

Suffrutex pedalis. *Partes veteres* glabræ, *juniores* tomento ferrugineo puberulæ. *Folia* breviter petiolata, integra, glabra, 3–5 unc. longa, 1–2 unc. lata. *Spicæ* virgatæ, breviter bracteolatæ, puberulæ, 4–8 unc. longæ. *Corollæ* tubus 1 unc. longus, angustissimus. *Capsula* apice 4-sperma. *Semina* compressa, testa rugosa.

2. E. HYPOCRATERIFORME, *Roem. et Sch. Syst. Veg.* i. p. 175; *N. ab E., DC. Prod.* xi. p. 454, *cum syn.*

Hab. Ad Sierra Leone, *Vogel* ! *in herb. Hook.*

3. E. DECURRENS, *Hochst. in Kotsch. et Schimp. Pl. Abyss.*; *N. ab E. l. c.* p. 453.

Hab. In umbra arborum ad fluvium Abyssinicum Tacaze, *Schimper*, n. 773 ! *in herb. Hook.*

XL. DICENTRANTHERA, *T. Anders.*

Corolla infundibuliformis; limbo 5-fido; lobis ovatis, æqualibus; tubo ad medium constricto. *Stamina* 4, didynama, filamentis per paria basi connatis; antheris bilocularibus, loculis ovatis, inæqualibus, basi bicalcaratis, mucronibus rigidis, uno longiore. *Stylus* teres, puberulus; stigmate apice recurvo, bidentato; lobis patentibus. *Ovarium* basi annulo crasso, crenato cinctum, 4–6-ovulatum. *Capsula* ignota.

1. D. MACROPHYLLA, *T. Anders.* Suffruticosa, caule erecto, cortice glabro; foliis petiolatis, oblongis, apice acuminatis, basi attenuatis, margine integris, paucinerviis, utrinque glabris; spicis terminalibus, solitariis, laxe multifloris; corolla infundibuliformi, tubo elongato, limbo subcampanulato, lobis æqualibus.

Hab. In montosis insulæ Fernando Po, *Mann* !

Suffrutex partibus, foliis exceptis, nigrescentibus. *Caulis* subtetragonus, glaber. *Folia* pedalia, 4 unc. lata, basi longissime attenuata; nervis 6–10. *Flores* in spicis verticillatis, bracteatis. *Spicæ* pedales, paniculatim ramosæ. *Calyx* parvus; laciniis æqualibus, sublobatis. *Corolla* 1½–2 unc. longa, utrinque glaberrima. *Stamina* 4, didynama; antheris bilocularibus, omnibus fertilibus; loculis basi bicalcaratis.

XLI. ASYSTASIA, *Blume.*

1. A. GANGETICA, *T. Anders. in Enum. Pl. Zeyl.* p. 235.—A. Coromandeliana, *N. ab E., DC. Prod.* xi. p. 165, *cum syn.*—A. quaterna, A. intrusa, A. Bojeriana, *N. ab E. l. c.* p. 166.—A. Comorensis, *Bojer et N. ab E. l. c.*—A. Capensis, *N. ab E. l. c. cum syn.*—A. calycina, *Benth. Fl. Nigrit.* p. 478.

Hab. In Africa tropica et insulis copiose, ad promontorium "Palmas" et "Grand Bassa," "Cape Coast," *Vogel* !; Senegambia, *Skues* !; Jebba ad fluvium Quorra, *Barter* !; Fayzokl, *Kotschy*, n. 423! *in herb. Hook.*;

ad ripas fluvii Suabo tributarii Zambesi, *Kirk*!; Port Natal, *Plant*!, *Krauss*!, *Drège*!; Bombatooka in insula Madagascar, *Bojer*!, *Lyall*!
Distr. Per totam Asiam tropicam ab Arabia ad insulam Java.

This is a widely distributed and very variable tropical weed, whose African forms have been described under the names I have quoted above. The remainder of the synonymy will be found at p. 235 of Thwaites's 'Enumeration of Ceylon Plants.' The colour of the corolla is generally pale yellow or white, with a few light purple spots on the lower lip.

2. A. Schimperi, *T. Anders.*—Adhatoda Rostellaria, var. β. humilis, *N. ab E. l. c.* p. 397, *cum syn.*
Hab. Abyssinia in graminosis prope Goelleb, ad altitudinem 4000 ped., *Schimper*, n. 2220!, et in vallibus prope Dscheladscheranne, *Schimper*, nn. 1657! et 1659!

3. A. Vogeliana, *Benth. Fl. Nigrit.* p. 479.
Hab. Ad vias in fruticetis in insula Fernando Po, *Vogel*!, *Mann*!; ad Abeokuta in Africa tropica occidentali, *Irving*!; in sylvis prope Angiama, *Barter*!

4. A. scandens, *Hook. Bot. Mag.* t. 4449, *excl. syn.*—A. quaterna, Ruellia quaterna, *et* Henfreya scandens, *Lindl. Bot. Reg.* 1847, *sub* t. 23.
Hab. In Sierra Leone, *Don*!, *Barter*!

XLII. Mackaya, *Harv.*

1. M. bella, *Harv. Thesaur. Cap.* i. p. 8. t. 13.
Hab. Inter saxa alveo fluvii "Tongat" prope Port Natal, *Sanderson*! *in herb. Hook.*

[The following species are described as new by the late Dr. Klotzsch in the Botany of Peters's 'Reise nach Mossambique.' The work was published in 1862 at Berlin, and has not reached Dr. Anderson.

Asystasia podostachys. Zanzibar.
—— *subhastata.* Boror.
—— *floribunda.* Boror.
—— *acuminata.* Querimba.
—— *pubescens.* Mossambique and Anjoana Island.
—— *scabrida.* Mossambique.
—— *multiflora.* Zanzibar.
—— *Querimbensis.* Querimba.
Barleria rhynchocarpa. Querimba Island.
—— *Querimbensis.* Querimba Isl.
Barleria consanguinea. Rios de Sena.
—— *squarrosa.* Rios de Sena; Tette.
—— *spinulosa.* Querimba, mainland.
—— *Senensis.* Rios de Sena.
—— *capitata.* Rios de Sena.
Blepharis pungens. Tette (*vide supra*, p. 34).
—— *acanthodioides.* Rios de Sena.
Crossandra pubescens. Boror.

Crossandra puberula. Rios de Sena.
Adhatoda formosissima. Rios de Sena; Tette.
—— *striata.* Rios de Sena.
—— *Mossambicensis.* Mossambique Island.
—— ? *microphylla.* Mossambique Island.
Rhinacanthus gracilis. Goa Island.
Eranthemum Senense. Rios de Sena; Boror.
Blechum hamatum. Rios de Sena.
Dicliptera Mossambicensis. Island and mainland of Mossambique.

Herb. Kew., 19 Feb. 1863.]

On the Spiral Markings of the Flocci in the Genus *Trichia*.

By the Rev. M. J. Berkeley, M.A., F.L.S.

[Read April 17, 1862.]

A good deal of controversy has arisen respecting the real nature of the spiral markings in the genus *Trichia*, which were first observed by Schmidel and the younger Hedwig, and afterwards more exactly, on modern improvements in the microscope, by Klotzsch and Corda, who were probably, at the time they made their observations, unaware of the earlier notices. The accuracy of Corda's drawings has, however, been called in question; and mycologists, a few months back, were pretty equally divided on either side, the one regarding the threads as real spiral vessels, the other insisting that the spiral lines were due to torsion, while Mr. Currey advocated a third opinion, in which he has been followed by De Bary and Wigand, viz. that the markings were due to elevations in the threads assuming a spiral direction.

The question has again been brought immediately under my notice by some observations of Mr. Knight, sent in a letter to Dr. Hooker from New Zealand, an extract of which I shall beg to lay before the Society.

"I notice," writes Mr. Knight, "in the review of Mr. Berkeley's 'Outlines of British Fungology' in the 'Natural History Review' of January 1861, p. 8, that the reviewer states, in respect of spiral vessels, that it is true that all the species of *Trichia* contain threads, all of which bear spiral markings, but the nature of these markings is still a subject of controversy.

"That these threads are true spiral threads I cannot doubt. I should, three or four years ago, have drawn your attention to the observations I had made on the subject, had I not been under the impression that the controversy had ceased, and the spiral nature of those cells been admitted.

"I send you now a tracing of a sketch which I made several years ago. You will see that there are three distinct continuous spirals—not asperities, nor what the reviewer terms arcuate elevations of the cell-wall following a spiral direction. That there may be no doubt of the correctness of the observation, I enclose for Mr. Berkeley a few specimens of a *Trichia* collected here. I have had them some time, and they may not be so well adapted for observation as when in a living state. With a good microscope and a $\frac{1}{5}$ object-glass the spirals are brought out quite distinct, but a $\frac{1}{8}$ may be necessary to enable one to count the number of spirals.

"Previous to observation, the specimen should be placed for a few hours in cold water, and then in boiling water. A shallow eye-glass would be best to use with the $\frac{1}{5}$; otherwise, from the age of the specimen, the crossing of the threads will give the appearance of asperities. The size of the spores is at least four times too great to admit of there being a spore attached to each asperity."

Just after the receipt of Mr. Knight's communication, a very learned paper, by Herr Wigand, appeared in Pringsheim's 'Jahrbücher für wissenschaftliche Botanik' (published at the end of November 1861) on the genus *Trichia* and the nearly allied genus *Arcyria*, which differs principally from *Trichia* in the absence of spiral markings, or rather in the frequent substitution of rings instead of spirals. The memoir is accompanied by numerous and most careful figures; and while it is quite convincing as to the threads bearing a very close relation to the spiral vessels of higher plants, it shows at the same time that they cannot be considered (at least, so far as herbarium specimens show) as vessels containing a free spiral thread, or even a raised spiral thread attached to the inner walls, but rather as having an elevation of their walls from within in a spiral direction, so as to leave a groove externally between each volution of the spiral,—the hollow of the spiral itself being filled up afterwards, it should seem, by the deposition of new matter, though never in such a degree as to produce a raised spiral thread within the tube: they resemble, in fact, if I may be allowed to use the illustration, a male screw rather than a female. As a proof of the deposit being subsequent to the spiral elevations, he adduces the fact that when first formed they are colourless, and that they only become opake at a later period of development. In certain states of *Trichia furcata*, as in *Arcyria punicea*, he finds rings instead of spirals, and, in some threads of the former, rings and spirals at the same time, with the addition of bladder-like swellings or beads towards the extremities. In *Trichia abietina* the spiral branches, and after two or three volutions becomes simple again, then running in a horizontal direction so as to form imperfect rings, and then again becoming oblique, exactly after the fashion of the mixed vessels of Phænogams. Such phases, it is clear, could never be presented by any twisting of a flat thread, even where there is one spiral alone—not to mention the fact that the threads are, from their earliest growth, not flat, but cylindrical—much less where the threads themselves are branched and, at the same time, irregular in outline, as is frequently the case. Till a thin vertical slice from a thread can be obtained, it may be impossible to say, so positively as to convince all gainsayers, notwithstanding the deeper tint, whether there is really any deposit in the inside of the threads corresponding to the spiral markings, though in any case the elevations are due simply to some action *within*, which takes place in a spiral or circular direction, passing occasionally from the one into the other.

I have examined Mr. Knight's specimens, prepared precisely according to his directions, and with an object-glass of $\frac{1}{5}$ I see, clearly enough to satisfy myself, that there is a depression in the membrane of the thread between each spiral, exactly as the structure is figured by Wigand, and, indeed, previously by Mr. Currey*, though, at the same time, it seems clear to me that there is no twisting of the thread, and that the appearance could never have been brought about by mere torsion. In *Batarrea* I have seen the vessels more closely approaching the type in Phænogams; and, unless I am greatly deceived, I have on former occasions, in individuals of *Trichia* which had just passed from the milky stage, seen nearer approaches to this than any which are figured in Wigand's plates. Be this, however, as it may, whether the difference be greater or less, it is pretty certain that the spiral marking of the threads is a case rather of affinity than analogy; and we cannot entirely deny the existence of spiral vessels in fungi, though they may exhibit a somewhat different type from that to which we are accustomed. I have seen precisely the same arcuate elevation in the cells of *Sphagnum*, respecting the spiral threads of which I believe there is no doubt.

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* Quarterly Journal of Microscopical Science, vol. iii. pl. 2. fig. 4.

Journal of an Expedition to the Coast and Capital of Madagascar, in the suite of the late Mission to King Radama. By CHARLES MELLER, M.D., Medical Attendant to the Embassy. Communicated by Sir W. J. HOOKER, F.R.S. & L.S.

[Read Dec. 4, 1862.]

H.M.S. Gorgon, Port Louis, Mauritius,
Sept. 10, 1862.

MY DEAR SIR WILLIAM,—I apprised you, in a letter written from the Naval Hospital at the Cape in June last, of the circumstances that had brought me there, and of those that made me very desirous to leave it and return to the Zambesi by the 'Gorgon'; to wit, the prospect of being attached to the Embassy deputed to carry addresses and presents from our Government to King Radama. Capt. Wilson of the 'Gorgon,' as a Commissioner, offered to attach me to his party as medical attendant, so that in such capacity I might have opportunity of collecting; and Dr. Shea, of the Naval Hospital, believing that a good sea voyage would do more for the relief of the enlarged spleen and remains of fever than a protracted residence in hospital, advised that I should request a passage from Admiral Walker, with this double purpose in view. A passage was readily granted. On arriving at Mauritius we found that Sir William Stevenson had organized an embassy, of which Major-General Johnstone was to be head, and Capt. Anson, R.A. (Inspector-General of Police), and Capt. Wilson of the 'Gorgon' Joint Commissioners, Lieut. Oliver, R.A., Aide-de-camp to the General, and myself as Medical Attendant. The Bishop of Mauritius subsequently joined the party, having a special errand to accomplish. The Queen's presents had been previously despatched under charge of an officer in the Colonial Department. Arriving at Tamatave on the 13th of July, we resided for a week in some houses set apart for the Embassy, whilst preparations were made for conveying the stores, &c. During this time official visits had to be made to the Governor and other officers; and I availed myself of invitations to their country houses, for the purpose of collecting specimens, and for information. The utmost cordiality was shown on every occasion to the Embassy or individuals of it, and every facility offered for acquiring information.

Marmites being obtained, and everything in readiness for the journey, we left Tamatave on the 22nd of July. The distance between Tamatave and Antananarivo was calculated, by the Mission which went from Mauritius to congratulate the King on his accession, at 225 miles; but as none of the gentlemen walked the distance, I am afraid they computed wrongly. We took the same number of days (17) from the one place to the other; and I walked the whole distance, with the exception of the first and last five miles, over which we had to be carried for the sake of leaving and entering these towns in due form; and I came to the conclusion that it is not more than 190 miles between these places, and that Antananarivo is not more than 130 miles from the sea at that part where, after walking south from Tamatave, we turn due west to penetrate the country. The first 60 miles of the road lie along the coast, on a spit of sand separating the sea from a chain of lakes, and sometimes so narrow that the sea at high water communicates with them. The first day's march was over a sandy plain, and across commons, on the short grass of which the herds of oxen collected near Tamatave for exportation were feeding. Skirting the sea, by Tamatave, is a dense wood or copse, with a few stout trees in it, used by the natives for making their smaller canoes, and which I believe to be a species of *Inophyllum*. There is abundance of wild coffee-shrubs in it, and of two species of Brexiads. Studding the plains about Tamatave, and more especially along the sea-board, is a *Logania*, called by the natives Voantaka—the same as that found by the Zambesi and Shiré. It yields an abundance of fruit, which is consumed (less the seeds) by the natives with avidity. With it, but much less frequently met with, is a *Clusia* (?) with edible fruit, and a *Zizyphus*, called Masaon by the Portuguese of the Zambesi, and Mason by the Mauritians. It is abundant in Mauritius, by the Zambesi, in Shiré, and Rovuma. There is not much of it on our road from Tamatave, and it was not seen after leaving the sea. Ornamenting the gardens of some of the merchants at Tamatave, and forming part of the sea-board bush, are two species of *Barringtonia*—one apparently the same as that found at Mohilla and Johanna (the fruit sent home in box No. 4), specimens of which were forwarded last February. The Copal gum-tree is very abundant along the sea, and for 70 miles of our way inland, being lost after this (the last tree seen being at about 800 to 1000 feet above the sea-level). It grows to a larger size than other trees I have seen; one found by the lakes about 29 miles from Tamatave measured 28 feet in circumference, had an enormous spread, and was full of fruit. Very little gum is collected. The natives incise the bark, and fix bamboos to receive the gum: to procure india-rubber they are less careful, merely making incisions, and allowing the sap to flow into a hole at the root of the tree. The natives procure their india-rubber from a trailing and climbing plant, whose order I am unacquainted with: it has thick cordate leaves, pear-shaped and -sized fruit, native name "Vaughina." (Fruit and india-rubber sent in box No. 4.) The *Ficus elastica* is found along the sea-board route, and a *Theophrasta*; but I am not aware that the Malagasy have recourse to these. In the journey by the coast the Morads, Euphorbias, and Myrtles are well represented. Dense, spreading, Box-like trees are held in great respect by the Betsimasaraks (a tribe of the south), who resort to these and other shade-affording trees, such as Lichis and Mangos, from devotional motives; and it is common to see beneath them the sticks, rags, and bamboos which devotees leave after paying their vows to the gods. The bamboo generally contains some rum or Betsibeti (the native rum) to propitiate the deities in favor of the supplicant who has left it. Ferns decorate trees, living and dead, on this part of the road; but they are far less varied than in that part which lies through the forests, where every tree is covered with lichens and mosses, and decayed trunks are shrouded in parasitic growths. The *Asplenium* (Corne de Bœuf; I am ignorant of its specific name), a *Pteris* (?), and several forms of *Polypodium* are most common, and many more with which I am unacquainted. Of Orchids the *Angræcum sesquipedale* and *superbum* are most prominent and numerous; they grow parasitic and terrestrial, from Tamatave, along the coast-line and for 60 miles inland, being lost sight of at about the same elevation as the Copal-tree. Three smaller species of *Angræcum* are also found, one sweet-scented, with a small white-flowered spike 1 to 1¾ foot long, and one with flowers alternately yellow and white; also a species of *Vanda* and two of *Dendrobium*, noticed by Mr. Ellis and pointed out to me in districts lying away from our road.

Growing in the plains to the height of 12 to 14 feet, from Tamatave to 20 miles inland, were two species of *Daphne*—one pink and the other white-flowered, both sweet-scented. A most conspicuous thriving shrub, a wild Mulberry, is found for the same distance; and the ground is studded with the *Vinca rosea* and several Acanthads (the same seen in Mauritius), and a blue-flowered *Lobelia*, and many more of whose class or name I am ignorant. Whilst the route lies by the lakes, two kinds of *Hibiscus* are conspicuous—one yellow-flowered, the other pink. Both trees afford, in their bark, material from which fine twine is made by the natives. There is another tree of the same form (with long cordate pointed leaves), called "Lafa," from the bark of which a coarser kind of cord is made.

On the second day's journey, a wide river, the Herondro, had to be crossed, and the road lay through a wide plain studded with decaying timber and leafless withered trees. Herds of oxen, thousands in number (one owner alone having 4000), fed here; and the grass was luxuriant, though the trees were mostly dead. Bleached, leafless trees, standing sentinel-like over the fallen, were topped or studded with earth-balls, the houses of the red ant; and of the fallen timber many had these deformities on them, and the covered ways of the red ants, which exist in great force on this part of the road. There is no indication of grass firing, no dearth of water or soil; yet few of the thousands of trees here have life. (Have the ants anything to do with this?)

The *Tanghinia veneniflua*, Voan Tangan of the Malagasy (the ordeal poison-tree), grows along the coast. It was in full flower and fruit as we passed. It is one of the most beautiful trees seen in the journey, and very abundant. From one of the Christians at Antananarivo, who went through the ordeal during the days of persecution in the late Queen's reign, I learnt the mode of its administration. The fruit was taken, bruised, and boiled whole. A fowl was boiled, and the broth set aside. Three pieces of the skin of the fowl were cut and put into the broth. A cupful of the poison was first administered, followed by another of the broth containing the three pieces of skin. If vomiting did not speedily set in, the poison soon killed; but if it did, it was kept up by constant exhibition of the broth and warm water, until the three pieces of skin were ejected. Should these obstinately remain, it was held as evidence of guilt, and another dose of the poison was administered.

Hanging from the fork of a tree by one of the lakes, I found a pendent ribbon-like fern*, the roots of which were fixed in a mass of earth and decomposed leaves collected in the hollow of the tree. Each ribbon fell to a distance of from 3 to 5 feet, then bi- or trifurcated, and from the under part sent down a spore-case, which contained in the ripe state a mass of yellow granular matter. The primary divisions fell from 1 to 3 feet more, then subdivided, and beneath each subdivision was a spore-case connected by a diverticulum. Some of these bands measured 12 feet.

Lining the beach from Tamatave to Andovorant, the point from which the road turns westward, are two species of *Pandanus* or

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* *Ophioglossum pendulum.*

Vacoa, and the Filhao tree. The Vacoa forms a thick, strong barrier against sand-drift, and is planted by the natives around villages by the sea with this intent. It forms a more complete barrier than the Hottentot Fig at the Cape.

Several species of Aloes grow in the same locality, a *Zamia* and the Brexiads before mentioned, also a Laurel-looking shrub with bunches of white berries. A *Cytisus* rising to 6 feet flourishes here, and is again met with on the red-clay hills near the capital, but not on the road between.

I have sent a specimen of the sand taken from the border of a brackish lake by the sea. It is found also inland by the rivers. It stains the hand black. It is very heavy, and full of shining particles like pulverized plumbago.

From Andovorant we leave the sea, take canoes up a lake for 8 or 10 miles to reach the first village of the ascent, and from the road being hitherto of sand it changes to fine yellow clay composing the banks of the lake, superimposed on which is a layer of loam, in which were growing, at the time we passed, some very good sugar-cane and *Gossypium*: there is only one species of cotton in the south; it is coarse, and of short staple. On either side of the lake are rising hills, the ravines between which are filled with Bamboo and *Ravenala*, the Traveller's Tree. This tree is met with here for the first time on the road, and is the companion of the traveller for 130 miles after leaving the coast, being lost sight of after reaching an elevation of about 2500 feet. It has been thought, by some gentlemen at Mauritius who have visited Madagascar, that Mr. Ellis was mistaken when he said that some of these trees rose to 30 feet in height. During our return journey from the capital the Bishop of Mauritius and I observed several of this altitude, and one, in a ravine near Ampassimbi (a village about 2000 feet above the sea), at least 40 feet high. At the end of the lake a canal is entered, passing through paddy-fields of fine rice; and at this part the banks were covered with ferns and the Stag's-horn moss: the Arums described by Mr. Ellis are, as he says, gigantic, and line each side of the lakes and canals. Overhanging the canal were several of the *Astrapæa Wallichii* in flower; a myrtle; the "Jambrosin" (the same found at Mauritius, with the same name, fruit edible); and an *Erythrina* with heads of scarlet flowers "like bunches of French-bean flowers," 40 to 50 feet high, with a trunk 4 feet in circumference, and wide-spreading branches—native name "Asamboion." On the banks too are several brilliant *Convolvuli*, the *Mucuna pruriens*, a *Poly-*

gala used by the natives as medicine for gastric irritation, and a blue-flowered small *Solanum* the leaves of which are eaten as a vegetable by the natives, who call it "Bred." It is sold in bundles in all the marketplaces. Encircling the bushes, pendent from small trees and shrubs, is a *Lycopodium* with fringed leaves, the fringe turning black when developed into spores; the edges of the young leaves are entire. It is found from this lake to 3500 feet alt., 40 miles from the capital. A wild Raspberry spreads over acres of land near the lake, and lines the path in all moist parts of the journey till approaching the capital, and the dry red soil 40 miles south of it. Both leaves and fruit are used as medicine, bruised and mixed with rice-water, emollient and expectorant.

The canal leads to the first village on the ascent, Maromby, the land round about which is constantly moist, almost alluvial. Abundance of rice is grown. Near this village were copses of *Vangueria*, and, around it and almost every village stopped at, a *Heliconia*, with pink offshoots or sprouts near the root, which are eaten by the natives. In the canals and pools, here and elsewhere, grows a *Lotus* (*Nymphæa*) with a blue flower; the bulb is in much request by the natives, who prepare from it a kind of sago. After leaving this lake and low district, the road leads over hills, hill rising beyond hill, the land mammillated with them; and truly the cattle seem grazing on a thousand hills. The ravines are filled with the Traveller's Tree, Bananas, and the Rofia Palm (*Sagus Ruffia*). The soil at the bottom of these ravines is very rich, and the vegetation most luxuriant—differing much from that at the highest elevation reached, where, from rockiness of the soil and absence of water, scarcely a plant thrives, and artificial aids are had recourse to, to enable the natives to grow their rice. As we ascend the country, the Rofia grows more abundantly, and the Ravenala less. The sides of valleys, and ultimately the crests of hills, become clothed with dense bush of a Composite tree with orange flowers, and two forms of *Arbutus* (?), both common at the Cape. The rivers crossed for the first 40 miles from the sea had fine-sandy bottoms, subsequently quartz and sand, and quartz and débris of sandstone.

Studding the hills, or standing out in solitary boulders, were masses of sandstone, the exposed surface blackened. The hills are well covered with a coarse grass, growing in tufts, amongst which is found an Apocyneous herb avoided by the cattle (the same as found up the Zambesi). On the second day's journey from the sea, and at about 1500 feet above it, is the village Ranumafain, and below it, running south, the river after which it is named. It is in this river (*Ranu*, water, *mafana*, hot) that the hot springs are found. As the hot current jets from the river-bottom below 2 feet of rapidly flowing spring-water, it is difficult to estimate the temperature by the thermometer. One jet is at a shallow part of the stream, and the heated water which was projected to the surface raised the thermometer at once to 160° Fahr. The foot or hand placed within reach of the jet felt scalded, and was instantly and involuntarily withdrawn. I counted five springs whilst walking across the stream; they are conspicuous by the bubbling of the water from escape of gas. Hearing that former visitors had found some difficulty in procuring the hot water by a jug or bottle, I used a bamboo for the purpose, first making a small hole at one end, which was stopped till the mouth covered well the spot from which the water issued; and I obtained, I believe, a good sample of it. The water had a faint smell, slight alkaline reaction, and insipid taste; a dollar, previously brightened on the sand, being dropped into the bamboo, was found completely blackened on examination two days subsequently.

From this river the country becomes more wooded, and on the third day's journey from the sea we enter the forest, after crossing many streams, and now meet with tree-ferns and several creeping ones. The road continues over tenacious yellow and red clay, studded here and there with quartz; and the river-beds are of sandstone, pebbles, and quartz. Floating in the less rapid streams were sometimes found the flowering stalks of the *Ouvirandra fenestralis*; but it was most abundant in the Ranomafain River, near the hot springs. I may mention that I collected some shells in the hot springs—a species of *Melania*: some were alive, but most dead, probably boiled. In the streams by the coast I saw small specimens of *Pistia stratiotes*, but not after leaving the coast. The Arums continue, and line the river-banks of this part of the country. Conspicuous on the banks of some of the rivers, and seen in many marshes, was a *Crinum* with large white flowers, sweet-scented: native name Kingass. That part of the country in which the woods first passed through are situated has the most prolific vegetation. There is a redundance of lichens, mosses, and ferns—all the older and larger trees being covered with all three. One lichen in particular abounds in every wood, and hangs from most of the larger trees; it resembles the *Roccella fuciformis* of the Zambesi and East Africa. From these woods is obtained some of the timber used in house-building, and brought down to

Tamatave for exportation. Small ebony is found here; but it is from woods more to the north-westward that the best supplies of ebony, teak, and other woods are obtained.

In the shady and moist parts of the woods I found several plants with variegated leaves—a *Coleus* with bright pink markings along the midrib and veins, and a *Sonerila* with silvery intramarginal markings, another with white spots in row, another with pink dottings and lines. There were four herbs in these woods with beautiful leaves of variegated tints, looking like "sports."

A fine *Calanthe*, with a spike as long as the finest *Angræcum*, is found in the woods north-east of Tamatave.

Having passed the thickest of the woods, a long stretch of hills follows. The soil is still of yellow clay, in many parts bearing evidence of containing iron; it is studded with masses of black basaltic rock. On one of these hills a view is obtained of the sea, distant some 30 miles. It is called "the weeping-place of the Hovas," because in times past, when slaves or offenders were brought down from the capital to be sold at the coast for exportation, it was from the summit of this hill that they saw the sea for the first time, and their native land for the last, the Hova country proper ceasing about 70 miles south of the capital.

The Rofia Palm continues in great abundance; and the hill-sides are covered with Citron-trees and the Composite bush before mentioned.

On the seventh day after leaving the coast we reached high table-land—a plain about 8 miles broad, said to extend in a north-west direction between 30 and 40 miles; it is bounded on the west by a ridge of mountains running north and south. There are several marshes and little lakes in the hollows, and much wild fowl. The grass is abundant, but coarse. Having passed the plain, the largest river crossed during the journey is met with: this is the Mangoro, about 90 yards wide, with a current equal to about two knots. Thirty miles below the part we crossed, it forms fine cataracts. It flows into the sea about 150 miles south of Tamatave. After crossing the river, more hills have to be ascended, the surface of which is composed of yellow clay; but a landslip near the river exposed three strata below this,—1st, a red clay, mixed with shining particles of what appeared like sedimentary sandstone; 2ndly, beneath this a red earth like lateritious detritus; and 3rdly, below these, and penetrating through them, lava-like honeycombed masses.

On these hills the Heath first seen near the sea is again met with, and for five or six miles nothing else is seen. But at the close of the day's journey we passed through a fine valley, well watered, with numerous villages and a large Hova population. There is now a decided change in the character of the country, houses, and people. In place of the undulating small hills, there is a single range of huge mountains. The houses, hitherto with but a single room, have now several, and are two-storied and built of planking, with sides of a composition (baked clay, &c.), and thatched with papyrus; whilst those previously passed have been either of rofia for sides and roof, or of split bamboo for the sides and a grass or rofia covering. This style of house continues to the capital. The clay used in some places is of a bluish colour. The inhabitants are all Hova, with their long black hair, ample lamba, and taciturn disposition and love of money.

Leaving them, there are but 40 miles to be passed to reach the capital; and the nearer it is approached, the less is the vegetation. The road at first lies through woods, with small timber; but after leaving these, it is over rugged hills of stiff red and yellow clay, protruding through which are massive boulders of granite. The largest village passed is almost built on the slabs of granite that pave the hill. The ravines are no longer filled with Rofia and shrubs, though the Rofia continues, and is found in gardens near the capital. Every available piece of good soil at the bottom of the ravines is carefully tended and manured for raising rice; and every little spring is diverted in many directions, to irrigate these little paddy-patches.

In the moist parts of the road a few shrubs are found; and the *Buddleia*, first met with on the sixth day from the sea, flourishes in profusion. A dwarf Heath clothes some of the most rugged of the rocks and hills, and a few of the ferns before met with are found in moist and secluded situations.

The hills close by the capital are perfectly bare; and there is but one conspicuous flower on which the eye can rest: this is Sunga-sunga of the natives (*Euphorbia fulgens*), of which there are two varieties, one a bright vermilion, the other bright orange. It grows from a thorny little plant, which creeps along the mud walls of the path, or those raised to enclose rice-grounds. It has an abundance of milky juice.

And this, Sir, is all my scanty knowledge of botany will allow me to say of the features of the road.

Mr. Ellis's description and sketch of the town (Antananarivo) give one no idea of its extent. It is built on the four sides of a hump-shaped hill; the houses rise tier over tier, each house enclosed in its square of mud or stone wall; and the whole town surmounted by the great white palace, and that again by the big bronze eagle and the national flag. It is difficult to estimate the population; an old resident said 70,000, others 100,000 and 150,000. It is densely populated. We found that the King's coronation was put off till the 23rd of September.

The seasons of Madagascar and the Zambesi country seem almost identical. The bad season in both is between November and March. The difference in the fever seems to be, that that of the Zambesi, from being at first a sthenic intermittent, resolves into remittent; that of the Malagasy is intermittent, with the stages irregular, and persisting in periodic return until full perspiration has been excited. The Embassy passed through the country during the healthiest time, and we had no fever; nor is there any heard of after leaving the coast, except at very marshy and naturally unhealthy situations. Antananarivo, though ill-drained, is healthy all the year round. The climate of the whole road was to all of us most bracing and invigorating. The maximum of the thermometer was 88° (at noon), and minimum 49° (between 4 and 6 A.M.), being almost the same as that observed last year (August) when I was at the Mission station at Magomero, Shiré River.

There are few diseases amongst the Malagasy. Small-pox is common, but seldom destroys, insomuch that the people refuse to be vaccinated, having little fear of it. There are several skin-diseases. Eczema and impetigo are very common. I saw a few cases of lepra, and two of elephantiasis. The skin-diseases are very bad. There is only one medicine used for them—the Menerara; and it seems to do good in some cases, especially the ulcerated. I think some forms of skin-diseases must be mistaken for syphilitic eruption, as I found far less evidence of the universal existence of this disease than I was led to suppose, though some of the cases seen were frightful; but then it must be recollected they have no remedies to check its ravages.

Believe me to be very faithfully yours,

CHARLES MELLER.

On a presumed case of Parthenogenesis in a Species of *Aberia*. By T. ANDERSON, M.D., F.L.S., Officiating Superintendent of the Calcutta Botanic Gardens.

[Read January 15, 1863.]

Two thorny bushes, supposed to be the Kei Apple of South Africa, and provisionally referred to *Diospyros*, have been for some years in the Botanic Gardens, Calcutta, without producing flowers. A few months after I received charge of the Botanic Gardens, in March 1861, the largest plant bore a large crop of well-ripened fruits, though only pistilliferous flowers could be detected at the time of flowering, the species being diœcious. The seeds obtained from these fruits were sown, and there is now a vigorous stock of young plants. In February 1862 the same plant flowered; and from the opening of the first flower-bud until the last withered flower dropped off, not a day passed without a careful examination being made by me for the traces of a stamen in the flowers, but without finding one. The plant continued in flower for nearly a month, but produced only pistilliferous flowers. Many of the ovaries became enlarged to the size of peas, and a corresponding increase took place in the ovules; but all ultimately fell off the tree. This tree was unfortunately destroyed a few months ago, in a very severe gale. The second specimen has not yet flowered; it was artificially propagated from the original plant, now lost, and is therefore pistilliferous. Before I saw the flowers, I despatched specimens of the fruit to Sir W. Hooker for the Museum at Kew. Dr. Hooker recognized the fruit as belonging to Hochstetter's genus *Aberia*; and my examination of the flowers confirms this identification*. The plant does not occur in Harvey & Sonder's 'Flora Capensis,' though these botanists describe two species of *Aberia* from South Africa†. I can find no account, among the records in my possession, of the introduction of the plant into the

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* That portion of the generic description referring to the number of the styles and the cells of the ovary must be altered to include this species. The number of styles in the other species is 2–3, and of the cells of the ovary 1–3, but usually 2. In *Aberia edulis* both the styles and the cells of the ovary are from 6–8 in number.

† [This species is described, in the Addenda to the 2nd volume of the 'Flora Capensis,' as *A. Caffra.*—J. D. H.]

Calcutta Botanic Gardens. I have added a description of the plant.

Aberia Caffra, *Hook. f. & Harv. in Fl. Cap.* ii. *Addend.* 584. Fruticosa, ramis strictis, spinis rigidis patentibus armatis, spinis longissimis, acutis; foliis petiolatis, ovatis, ovato-oblongis, basi attenuatis, apice obtusis, emarginatis, margine integris, glabris, coriaceis, paucinerviis; floribus fœmineis solitariis, pedunculatis, in ramulis abbreviatis 4–5 confertis; calyce 5–8-partito, plerumque 7-partito, persistente, petalis et staminibus nullis; ovario globoso, glabro, 6- vel 7-locularis, rare 8-locularis; stylis 6–8, divergentibus, minute puberulis; fructu globoso, glabro, carnoso, seminibus ovatis, compressis.

Hab. In horto botanico Calcuttensi, ex Africa australi, culta.

Frutex 15-20-pedalis. *Cortex* cinereus, glaber. *Rami* striati, spinosi. *Spinæ* axillares, patentes, rigidæ, 1½–3 unc. longæ. *Folia* in virgis, alterna, in ramis veteribus fasciculatis, 1–2 unc. longa, ½–1¼ unc. lata, petiolo ¼–½ unc. longo. *Flores masculi* ignoti; *fœminei* glabri, pallide virides, parvi, pedunculo glabro, fere ½ unc. longo. *Fructus* pomum parvum in magnitudine æquans, basi calyce persistente cinctus; cortice flavo; succo flavo, sublacteo, in usu grato.

On a new *Heliconia* with the habits of a *Musa*, sent from New Granada by Dr. A. Anthoine to the Royal Gardens, Kew. By J. D. Hooker, M.D., F.R.S. & L.S.

[Read January 15, 1863.]

This very remarkable plant was first brought under my notice by P. Le Neve Foster, Esq., Secretary of the Society of Arts, who received a sketch of it from Dr. Anthoine of Carthagena, with some account of the fibre its peduncles produce. Mr. Foster put me in communication with Dr. Anthoine, who exerted himself at once in procuring dried specimens and seeds for the Royal Gardens of Kew. The former consist of three perfect spikes, and some flowers dried for examination, which, with his sketch and notes, have enabled me to draw up the following description:—

The habit, size, and general appearance of this noble plant are those of a *Musa*, the trunk, which attains 12–16 feet in height, being formed by the vaginæ of the leaves. The peduncles project far beyond the leaves, and, curving downwards, bear a large, narrow, flattened spike, 2½ feet long, something resembling the tail-rattle of the rattlesnake on a gigantic scale. The structure of the flower and fruit accords perfectly with that of other *Heliconiæ*, but these organs are almost concealed by the spathe and bracts. Its nearest known ally is probably *H. rostrata*, Ruiz and Pavon, a native of Peru. Dr. Anthoine desires that this noble plant should bear the name of the Empress of Russia, which I have therefore attached to it.

Heliconia Mariæ, *Hook. f.* Foliorum vaginis truncum elatum efformantibus, lamina oblonga petiolata ampla, spicis longe pedunculatis pendulis, spathis crebre dense disticho-imbricatis rachin omnino velantibus late ovato-cymbiformibus recurvis obtusis, floribus bracteis inclusis glabratis.

Hab. Betami on the Sinu River (lat. 8° N.), State of Bolivar, in New Granada (*Dr. A. Anthoine*).

Truncus 3–4 metr., cum foliis 6 metr., etiam 10–15 centimetr., lævis, viridi-purpureus (*Anth.*). *Folia* oblonga v. lineari-oblonga, obtusa, 3–4 ped. longa, petiolo æquilonga, viridia. *Pedunculus* crass. digiti, curvus, glaber, siccus flexuosus, teres, intus vasibus mollibus farctus. *Spicæ* 1½ ped. longæ, 3–4 poll. latæ, lineares, obtusæ, compressæ. *Spathæ* 60–80, dense imbricatæ, reflexæ, valde concavæ, late ovato-cymbiformes, glabræ v. pubescentes, lateribus erectis, basin versus subcordatæ, marginibus undulatis, apice obtusiusculæ; infimæ rostratæ; inferiores 1–2 distantes, 4–5 unc. longæ, rachin pubescentem non tegentibus; cæteræ 2–2½ unc. longæ, rachin velantes; superiores inferiores amplectentes. *Flores* rubri (*Anth.*), in spatha singula 15–20, bracteis lineari-lanceolatis glabriusculis inclusi, receptaculo brevissimo in axilla spathæ inserti; apicibus perianthii tantum exsertis. *Bracteæ* albæ, spatha breviores, ovato-lanceolatæ, basi concavæ, exteriores vacuæ. *Pedicelli* ½″ longi, crassiusculi, villosuli, compressi. *Ovarium* trigonum. *Perianthium* 1″ long., foliolis extus subtomentosis. *Stylus* apice incurvus. *Antheræ* inclusæ. *Drupa* cærulea (*Anth.*), 3-cocca; coccis oblongis, compressis, basi antice fovea cupulæformi notatis, subrugosis, osseis, intus subrugosis. *Semen* erectum; testa membranacea, raphe annulari circumdata. *Albumen* subfarinaceum. *Embryo* axillaris, gracilis, extremitate radiculari paulo crassiore, germinatione foveam cocci perforante.

On the existence of two forms, and on their reciprocal sexual relation, in several species of the genus *Linum*. By Charles Darwin, M.A., F.R.S., F.L.S., &c.

[Read February 5, 1863.]

The crimson *Linum grandiflorum* presents two forms, occurring in about equal numbers, which differ little in structure, but greatly in function. The foliage, corolla, stamens, and pollen (examined dry, and distended with water) are alike in both forms. The difference is confined to the pistil: in the one form, which I will call "short-styled," the column formed by the united styles, and the short stigmas, together is about half the length of the whole pistil in the other and "long-styled" form. A more important distinction is, that the five stigmas in the short-styled form diverge greatly from each other and pass out between the filaments of the stamens, and thus lie within the tube of the corolla. In the long-styled form the elongated stigmas stand nearly upright, and alternate with the anthers. In this latter form the length of the stigmas varies considerably, their upper extremities projecting even a little above the anthers, or reaching up only to about their middle. Nevertheless there is never the slightest difficulty in distinguishing between the two forms; for, besides the difference in divergence, the stigmas of the short-styled form never reach even to the bases of the anthers. In the short-styled, the papillæ on the stigmatic surfaces are shorter, darker-coloured, and more crowded together than in the long-styled form: but these differences seem due merely to the shortening of the stigma; for in the varieties of the long-styled form with shorter stigmas, the papillæ are more crowded and darker-coloured than in those with the longer stigmas. Considering the slight and variable differences between the two forms of this *Linum*, it is not surprising that they have been hitherto overlooked.

In 1861 I had eleven plants growing in my garden, eight of which were long-styled, and only three short-styled. Two very fine long-styled plants grew in a bed a hundred yards off, and separated from the others by a screen of evergreens. I marked twelve flowers, and put on their stigmas a little pollen from the short-styled plants. The pollen of the two forms is, as stated, identical in appearance; the stigmas of the long-styled flowers were already thickly covered with their own pollen—so thickly that I could not find one bare stigma; and it was late in the season, namely, September 15th. Altogether, to expect any result from this trial seemed almost childish. From my experiments, however, on *Primula*, which have been laid before this Society ('Journal,' vol. vi. p. 77), I had faith, and did not hesitate to make the trial, but certainly I did not anticipate the full result. The germens of these twelve flowers all swelled, and ultimately six fine capsules (the seed of which germinated this year) and two poor capsules were produced; only four capsules shanked off. These two plants produced, before and after and at the time of the trial, a vast number of flowers, but the germens of not even one swelled. All these flowers, though their stigmas were so densely covered with their own pollen, were absolutely barren.

The nine other plants, six long-styled and three short-styled, grew in the beds of the same flower-garden. Four of the long-styled produced no seed-capsules; one produced two; but the remaining long-styled plant grew so close to a short-styled plant that their branches touched, and this produced twelve capsules, but they were poor. The case was different with the short-styled plants. The plant which grew in juxtaposition with the long-styled plant produced ninety-four imperfectly fertilized capsules containing a multitude of bad seeds, with a moderate number of good seeds. The two other short-styled plants grew in a single clump, and were very small, being partly smothered by other plants; they did not stand very close to any long-styled plants, yet they yielded together nineteen capsules. These facts seem to show that the short-styled plants are far more fertile with their own pollen than the long-styled. We shall immediately see that this is the case in a slight degree. But I suspect that in this instance the difference in fertility between the two forms was in part due to a distinct cause. I repeatedly watched the flowers, and only once saw a humble-bee momentarily alight on one, and then fly away, as if it were not to its taste. If bees had visited the several plants, there cannot be a doubt that the four long-styled plants which did not produce a single capsule would have borne an abundance. But several times I saw small diptera sucking the flowers; and these insects, though not visiting the flowers with anything like the regularity of bees, would carry a little pollen from one form to the other, especially when growing close together; and the stigmas of the short-styled plants, diverging within the tube of the corolla, would be more likely than the upright stigmas of the long-styled to receive a small quantity of pollen when brought by small insects. From the much greater number of long-styled than of short-styled flowers in the garden, evidently the short-styled would be more likely to receive some pollen from the long-styled, than the long-styled from the short-styled.

In 1862 I raised thirty-four plants of this *Linum* in a hotbed; and these consisted of seventeen long-styled and seventeen short-styled forms. Seed sown later in the flower-garden yielded seventeen long-styled and twelve short-styled forms. These facts justify the statement that the two forms are produced in about equal numbers. The first thirty-four plants were kept under a net which excluded insects. I fertilized heteromorphically fourteen long-styled flowers with pollen from the short-styled, and got eleven fine seed-capsules; these contained on an average 8·6 seeds per capsule, but only 5·6 were apparently good. It may be well to state that ten seeds is the maximum possible production for a capsule, and that our climate cannot be very favourable to this North-African plant. On three occasions I fertilized homomorphically the stigmas of altogether nearly a hundred flowers (but did not separately mark them) with their own pollen, but taken from separate plants, so as to prevent any possible ill effects from close interbreeding; and many other flowers were produced, which, as before stated, would get plenty of their own individual pollen; yet from all these flowers, borne by the seventeen long-styled plants, only three capsules were produced; one of these included no seed, and the other two together gave only five good seeds. Nor do I feel at all sure that this miserable product of the two half-fertile capsules from the seventeen plants, each of which must have produced at least fifty or sixty flowers, is really the result of their fertilization by their own pollen; for I made a great mistake in keeping the two forms under the same net, with their branches often interlocking, and it is surprising that a greater number of flowers were not accidentally fertilized.

Of the short-styled flowers I fertilized heteromorphically twelve with the pollen of the long-styled (and to make sure of the result I previously castrated the majority), and obtained seven fine seed-capsules. These included an average of 7·6 seeds, but of apparently good seed only 4·3 per capsule. At three separate times I fertilized homomorphically nearly a hundred flowers with their own-form pollen, taken from separate plants; and numerous other flowers were produced, many of which must have received their own pollen. From all these flowers borne on the seventeen plants, only fifteen capsules were produced, of which only eleven contained any good seed, on an average 4·2 per capsule. As remarked in the case of the long-styled plants, some even of these capsules were perhaps the product of a little pollen accidentally fallen from the flowers of the other form. Nevertheless the short-styled plants seem to be slightly more fertile with their own pollen, in the proportion of fifteen capsules to three, than the long-styled: the real proportional excess in fertility is probably a little greater, as the short-styled flowers, when not disturbed, do not so surely receive their own pollen as do the long-styled. The greater self-fertility of the short-styled flowers was, as we have seen, also shown by the plants left to themselves, and but sparingly visited by insects, in the flower-garden in 1861, and likewise by those raised in 1862.

The absolute sterility (judging from the experiments of 1861, and which is hardly contradicted by those of 1862) of the long-styled plants with their own-form pollen led me to examine into its apparent cause; and the result is so curious that it will be worth while to give most of the experiments in detail. These experiments were tried on fresh plants, grown in pots and brought successively into the house.

First. I placed pollen from a short-styled flower on the five stigmas of a long-styled plant, and after thirty hours found them deeply penetrated by a multitude of pollen-tubes, far too numerous to be counted; the stigmas had become discoloured and twisted. I repeated this experiment on another flower, and in 18 hours found the stigmas penetrated by a multitude of long pollen-tubes. All this is what might have been expected, as this is a fertile or heteromorphic union. I likewise tried the converse experiment, and placed pollen from a long-styled flower on the stigmas of a short-styled flower, and in 24 hours found the stigmas discoloured, twisted, and penetrated by numerous pollen-tubes; and this, again, is what might have been expected, as this is a fertile or heteromorphic union.

Secondly. I placed pollen of a long-styled flower on all five stigmas of a long-styled flower on a separate plant: after 19 hours I rigorously dissected the stigmas, and found only a single pollen-grain which had emitted a very short tube. To make sure that the pollen was good, I took in this case, and in most other cases, pollen either from actually the same anther or from the same flower, and proved it to be good by placing it on the stigma of a short-styled plant, and seeing numerous pollen-tubes emitted.

Thirdly. Repeated last experiment, and placed own-form pollen on all five stigmas of a long-styled flower; and, after 19½ hours, not one single grain had emitted its tube.

Fourthly. Repeated the experiment, with the same result after 24 hours.

Fifthly. Repeated last experiment, and, after leaving pollen on for 19 hours, put an additional quantity of own-form pollen on all five stigmas. After an interval of exactly three whole days, I rigorously examined the stigmas, which, instead of being discoloured and twisted, were straight and fresh-coloured; and only one grain had emitted quite a short tube, which could be drawn out of the stigmatic tissue without being ruptured.

The following experiments are more striking:—

Sixthly. I placed own-form pollen on three of the stigmas of a long-styled flower, and pollen from a short-styled flower on the other two stigmas. After 22 hours these two stigmas were discoloured, and slightly twisted, and penetrated by the tubes of numerous pollen-grains: the other three stigmas, covered with their own-form pollen, were fresh, and all the pollen-grains were loose; but I did not dissect the whole stigma rigorously.

Seventhly. Experiment repeated in the same manner, with the same result.

Eighthly. Experiment repeated, but the stigmas were carefully examined after an interval of only 5½ hours. The two stigmas with pollen from a short-styled flower were penetrated by innumerable tubes; but these were as yet short, and the stigmas themselves were not at all discoloured. The three stigmas covered with their own-form pollen were not penetrated by a single pollen-tube.

Ninthly. Put pollen of short-styled on one stigma, and own-form pollen on the other four stigmas; after 24 hours, found the one stigma somewhat discoloured, and twisted, and penetrated by many long tubes: the other four stigmas were quite straight and fresh; but on dissecting their whole lengths I found that three pollen-grains had protruded quite short tubes into the tissue.

Tenthly. Repeated the experiment, with the same result after 24 hours, excepting that only two own-form grains had penetrated the stigmatic tissue with their tubes, to a very short depth: the one stigma, which was deeply penetrated by a multitude of tubes from the short-styled pollen, presented a conspicuous difference in comparison with the other four straight and bright pink stigmas, in being much curled, half-shrivelled, and discoloured.

I could add a few other experiments; but those now given amply suffice to show that the pollen-grains of a short-styled flower placed on the stigmas of a long-styled flower emit a multitude of tubes after an interval of from five to six hours, and penetrate the tissue ultimately to a great depth, and that after twenty-four hours the stigmas thus penetrated change colour, become twisted, and appear half-withered. On the other hand, the pollen-grains of the long-styled flowers placed on their own stigmas, after an interval of a day, or even three days, do not emit their tubes, or at most only three or four grains out of a multitude emit their tubes; and these apparently never penetrate the stigmatic tissue deeply, and the stigmas themselves do not become discoloured and twisted.

This seems to me a remarkable physiological fact. The pollen-grains of the two forms are undistinguishable under the microscope; the stigmas differ only in length, degree of divergence, and in the size, shade of colour, and approximation of their papillæ, these latter differences being variable and apparently simply due to the elongation of the stigma. Yet we plainly see that the two pollens and the two stigmas are widely dissimilar in action—the stigmas of each form being almost powerless on their own pollen, but causing, through some mysterious influence, by simple contact (for I could detect no viscid secretion), the pollen-grains of the opposite form to protrude their tubes. It may be said that the two pollens and the two stigmas by some means mutually recognize each other. Taking fertility as the criterion of distinctness, it is no exaggeration to say that the pollen of the long-styled *Linum grandiflorum* (and conversely of the other form) has been differentiated, with respect to the stigmas of all the flowers of the same form, to a degree corresponding with that of distinct species of the same genus, or even of species of distinct genera.

Linum perenne.—The dimorphism is here more conspicuous, and has been noticed by several authors. In the long-styled form the pistil is nearly twice as long as in short-styled; in the latter the stigmas are smaller and, diverging more, pass out between the filaments of the stamens. I could detect no difference in the size of the stigmatic papillæ; in the long-styled form alone the stigmatic surfaces turn round so as to face the circumference of the flower: but to this point we shall presently return. Differently from what occurs in *L. grandiflorum*, the long-styled flowers have stamens hardly more than half the length of those of the short-styled. The size of the pollen-grains is rather variable; after some doubt, I have come to the conclusion that there is no uniform difference between the pollen of the two forms. The long stamens in the short-styled form project to some height above the corolla, and, apparently from exposure to the light, the filaments are coloured blue. These longer stamens correspond in height with the lower part of the stigmas of the long-styled flowers; and the shorter stamens of the latter form correspond in the same manner in height with the shorter stigmas of the short-styled flowers.

I raised from seed twenty-six plants, which proved to be twelve long-styled and fourteen short-styled. They flowered well, but were not large plants. As I did not expect them to flower so soon, I did not transplant them, and they unfortunately grew with their branches closely interlocked. All the plants were covered by a net, excepting one of each form. First, of the long-styled flowers, twelve were homomorphically fertilized by their own-form pollen, taken in every case from a separate plant; and not one flower set a seed-capsule: twelve other flowers were heteromorphically fertilized by pollen from short-styled flowers; and they set nine pods, each including on an average seven good seeds: as before, ten seeds is the maximum possible production. Secondly, of the short-styled flowers, twelve were homomorphically fertilized by own-form pollen, and they yielded one capsule, including only three good seeds; twelve other flowers were heteromorphically fertilized by pollen of long-styled flowers, and these produced nine capsules, but one was bad; the eight good capsules contained on an average exactly eight good seeds each.

The many flowers on the eleven long-styled plants under the net, which were not fertilized, produced only three capsules (including 8, 4, and 1 good seeds); whether, owing to the interlocking of the branches, these accidentally received pollen from the other form, I will not pretend to conjecture. The single long-styled plant which was uncovered, and grew close by the uncovered short-styled plant, produced five good pods; but it was a very poor and small plant.

The flowers borne on the thirteen short-styled plants under the net, which were not fertilized, produced twelve capsules (containing 5·6 seeds on average): as some of these capsules were very fine, and five were borne on one twig, I suspect that they had been visited by some minute insect which had accidentally got under the net and had carried pollen from the other form. The one uncovered short-styled plant yielded exactly the same number of capsules, namely, twelve.

From these facts we have some evidence, as in the case of *L. grandiflorum*, that the short-styled plants are in a very slight degree more fertile with their own pollen than are the long-styled plants. And we have the clearest evidence, from the result of the forty-eight flowers artificially fertilized, that the stigmas of each form require pollen from the stamens of corresponding height produced by the opposite form.

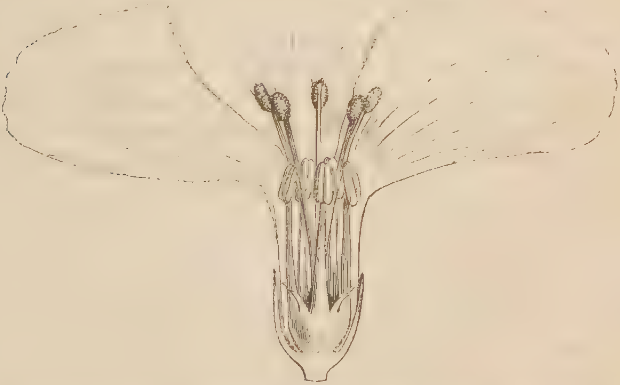
In contrast with the case of *L. grandiflorum*, it is a singular fact that the pollen-grains of both forms of *L. perenne* when placed on their own-form stigmas, though not causing fertility, yet emit their tubes; and these tubes I found, after an interval of eighteen hours, had penetrated the stigmatic tissue, but to what depth I did not ascertain. In this case the inaction of the pollen-grains on their own stigmas must be due either to the tubes not reaching the ovules, or reaching them and not efficiently acting on them. In the case of *Lythrum Salicaria*, which I hope at some future time to lay before the Society, there are three distinct forms, each of which produces two kinds of pollen; but neither pollen, when placed on its own stigma, causes fertility, except occasionally and in a very moderate degree; yet the pollen-tubes in each case freely penetrate the stigmatic tissue.

The plants of *L. perenne* and of *L. grandiflorum* grew, as stated, with their branches interlocked, and with scores of flowers of the two forms close together; they were covered by an open net, through which the wind, when high, passed; and such minute insects as *Thrips* could not, of course, be excluded; yet we have seen that the utmost possible amount of accidental fertilization on seventeen long-styled plants in the one case, and on eleven plants in the other case, was the production, in each, of three poor capsules; so that we may infer that, when the proper insects are excluded, the wind does hardly anything in the way of carrying pollen from plant to plant. I allude to this fact because botanists, in speaking of the fertilization of plants or of the production of hybrids, often refer to the wind or to insects as if the alternative were indifferent. This view, according to my experience, is entirely erroneous. When the wind is the agent in carrying pollen, either from one separated sex to the other, or from hermaphrodite to hermaphrodite (which latter case seems to be almost equally important for the ultimate welfare of the species, though occurring perhaps only at long intervals of time), we can recognize structure as manifestly adapted to the action of the wind as to that of insects when they are the carriers. We see adaptation to the wind in the incoherence of the pollen, in the inordinate quantity produced (as in the Coniferæ, Spinage, &c.), in the dangling anthers well fitted to shake out the pollen, in the absence or small size of the perianth or in the protrusion of the stigmas at the period of fertilization, in the flowers being produced before they are hidden by the leaves, in the stigmas being downy or plumose (as in the Gramineæ, Docks, and other plants) so as to secure the chance-blown grains. In plants which are fertilized by the wind, the flowers do not secrete nectar, their pollen is too incoherent to be easily collected by insects, they have not bright-coloured corollas to serve as guides, and they are not, as far as I have seen, visited by insects. When insects are the agents of fertilization (and this is incomparably the more frequent case both with plants having separated sexes and with hermaphrodites), the wind plays no part, but we see an endless number of adaptations to ensure the safe transport of the pollen by the living workers. We can recognize these adaptations most easily in irregular flowers; but they do not the less occur in perfectly regular flowers, of which those of *Linum* offer an instance, as I will almost immediately endeavour to show.

I have already alluded to the rotation of each separate stigma in the long-styled form alone of *Linum perenne*. In the other species examined by me, and in both forms when the species are dimorphic, the stigmatic surfaces face the centre of the flower, and the furrowed backs of the stigmas, to which the styles are attached, face the circumference. This is the case, in the bud, with the stigmas of the long-styled flowers of *L. perenne*. But by the time the flower in this form has expanded, the five stigmas, by the torsion of that part of the style which lies beneath the stigma, twist round and face the circumference. I should state that the five stigmas do not always perfectly turn round, two or three often facing only obliquely towards the circumference. My observations were made during October; and it is not improbable that earlier in the season the torsion would have been more perfect; for after two or three cold and wet days the movement was very incomplete. The flowers should be examined shortly after their expansion; for their duration is brief, and, as soon as they begin to wither, the styles become spirally twisted together, and the original position of the parts is lost.

He who will compare the structure of the whole flower in both forms of *L. perenne* and *grandiflorum*, and, I may add, of *L. flavum*, will, I think, entertain no doubt about the meaning of this torsion of the styles in the one form alone of *L. perenne*, as well as the meaning of the divergence of the stigmas in the short-styled forms of all three species. It is absolutely necessary, as we now know, that insects should reciprocally carry pollen from the flowers of the one form to those of the other. Insects are attracted by five drops of nectar, secreted exteriorly at the base of the stamens, so that to reach these drops they must insert their proboscides outside the ring of broad filaments, between them and the petals. In the short-styled form of the above three species, the stigmas face the axis of the flower; and had the styles retained their original upright and central position, not only would the stigmas have presented their backs to insects as they sucked the flowers, but they would have been separated from them by the ring of broad filaments, and could never have been fertilized. As it is, the styles diverge greatly and pass out between the filaments. The stigmas, being short, lie within the tube of the corolla; and their papillous faces, after the divergence of the styles, being turned upwards are necessarily brushed by every entering insect, and thus receive the required pollen.

In the long-styled form of *L. grandiflorum*, the parallel anthers and stigmas, slightly diverging from the axis of the flower, project only a little above the tube of the somewhat concave corolla; and they stand directly over the open space leading to the drops of nectar. Consequently when insects visit the flowers of either form (for the stamens in this species occupy the same position in both forms), they will get their proboscides well dusted with the coherent pollen. As soon as the insect inserts its proboscis to a little depth into the flower of the long-styled form, it will necessarily leave pollen on the faces and margins of the long stigmas; and as soon as the insect inserts its proboscis to a rather greater depth into the short-styled flowers, it will leave pollen on their upturned stigmatic surfaces. Thus the stigmas of both forms will indifferently receive the pollen of both forms; but we know that the pollen alone of the opposite form will produce any effect and cause fertilization.



Long-styled form of *L. perenne*, var. *Austriacum*, with the petals and calyx removed on the near side.

In the case of *L. perenne*, affairs are arranged a little more perfectly; for the stamens in the two forms stand at different heights, and pollen will adhere to different parts of an insect's body, and will generally be brushed off by the stigmas of corresponding height, to which stigmas each kind of pollen is adapted. In this species, the corolla is flatter, and in the one form the stigmas and in the other form the anthers stand at some height above the mouth of the corolla*. These longer stigmas and longer stamens do not diverge greatly; hence insects, especially rather small ones, will not insert their proboscides between the stigmas or between the anthers, but will strike against them, at nearly right angles, with the backs of their head or thorax. Now, in the long-styled flowers of *L. perenne*, if each stigma had not rotated on its axis, insects in visiting them would have struck their heads against the backs of the stigmas; as it is, they strike against the papillous fronts of the stigmas, and, their heads being already charged with the proper coherent pollen from the stamens of corresponding height borne by the flowers of the other form, fertilization is perfectly effected.

Thus we can understand the meaning of the torsion of the styles in the long-styled flowers alone, as well as their divergence in the short-styled flowers.

One other point is worth a passing notice. In botanical works many flowers are said to be fertilized in the bud. This rests solely, as far as I can discover, on the anthers opening in the bud; no evidence is adduced that the stigma is at this period mature, or that, if then penetrated by pollen-tubes, it is not subsequently, after the expansion of the flower, acted on by pollen brought from other flowers. In the case of *Cephalanthera grandiflora* I have shown† by experiment that insufficient precocious self-fertilization, together with subsequent full fertilization, is the regular course of events. The belief that flowers of any plant are habitually fertilized in the bud, or are perpetually self-fertilized, is a most effectual bar to really understanding their structure. I am far from wishing to say that some flowers, in certain seasons, are not fertilized in the bud: I have reason to believe that some flowers are frequently fertilized without expanding; but my observations lead me to disbelieve that this is ever the invariable course with all the flowers of any species whatever. As it is difficult to prove without troublesome experiments the falsity of the belief of regular fertilization in the bud, I here notice this subject. An estimable and laborious observer*, resting his belief on the usual kind of evidence, states that in *L. Austriacum* (which is dimorphic and is considered by Planchon as a variety of *L. perenne*) the anthers open the evening before the expansion of the flowers, and that the long-styled stigmas are then almost always fertilized. He asks whether this precocious fertilization in the several species of *Linum* and in other plants is not one cause of the short duration of their flowers. Now we know positively that, so far from *Linum perenne* being fertilized by its own pollen in the bud, its own pollen is as powerless on the stigma as so much inorganic dust.

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* I neglected to get drawings made from fresh flowers of the two forms. Mr. Fitch has made the above sketch of a long-styled flower from dried specimens and published engravings: his well-known skill ensures accuracy in the proportional size of the parts; and I believe their relative position is true.

† Fertilization of Orchids, p. 108.

Linum flavum.—To recur to our more immediate subject, in the long-styled form of this species the pistil is nearly twice as long as in the short-styled form; and the stigmas are longer with the papillæ coarser. In the short-styled form the stigmas diverge and pass out between the filaments. The stamens in the two forms differ in height, and, what is singular, the anthers of the longer stamens are shorter; so that in the short-styled form both stigmas and anthers are shorter than in the other form. The pollen of the two forms does not differ. I have not been able to try any experiments on this species; but a careful observer, Mr. W. C. Crocker, intends proving their reciprocal fertility next summer. As this plant is propagated by cuttings, I have generally found that all the plants in the same garden belong to the same form. On inquiry I have never heard of its seeding in this country; but to anyone wishing to raise seedlings, in all probability the path is now open, namely, by carrying pollen from one form to the other.

I have now shown that three species of *Linum* are dimorphic, besides several races of *L. perenne*, esteemed by some botanists to be distinct species, such as *L. montanum*, *L. Sibiricum*, and *L. Austriacum*. According to Vaucher†, *L. Gallicum*, *L. maritimum*, and *L. strictum* are in the same manner dimorphic, as likewise is, according to Planchon‡, *L salsoloides*. This latter botanist is the only one who seems to have been struck with the importance of the subject; and he acutely asks whether this dimorphism has not some influence on the manner of fertilization. We thus know of seven dimorphic species of *Linum*; but as this structure has been overlooked in such common garden-flowers as *L. grandiflorum* and *L. flavum*, it is probably of frequent occurrence.

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* Études sur la Géograph. Bot., par Prof. H. Lecoq, 1856, tom. v. p. 325.

† Hist. Physiolog. des Plantes d'Europe, 1841, tom. i. p. 401.

‡ Hooker's London Journ. of Botany, 1848, vol. vii. p. 174.

All the species, however, are certainly not thus characterized. I have examined many specimens of *L. catharticum*, and found in all that the stamens and stigmas were of nearly equal height and the same in all the plants. So, again, I looked, near Torquay, at many flowers of the wild *L. usitatissimum* or *angustifolium* (I know not which), and there was no trace of dimorphism. Again, I raised 111 plants from seed sent me from Kew, incorrectly named *L. Austriacum*; the plants were tall and straight, having a rather different aspect from the wild species seen at Torquay, with extremely fugacious blue flowers: in all these plants the stigmas stood on a level with the anthers or projected a very little above them. I protected the flowers from insects; but every one of the 111 plants produced plenty of seed. I mention this fact because it had occurred to me that possibly a species might be dimorphic in function, though not in structure.

Lastly, *Linum Lewisii*, which is ranked by Planchon as a variety of *L. perenne*, but which, now that we know the meaning of reciprocal dimorphism, surely deserves specific honours, must not be passed over. According to Planchon*, the same plant bears some flowers with anthers and stigmas of the same height, and others with styles either longer or shorter than the stamens; so that the same individual plant is trimorphic. This, as far as I know, is a unique case. From analogy we may pretty safely predict the function of the three kinds of flowers: those with stigmas and anthers of the same height will be self-fertile; those with these organs of unequal height will require reciprocal fertilization. A plant of *L. grandiflorum* or of the other dimorphic species, growing by itself, could no more perpetuate its race than could one sex of a diœcious plant, nor could any number of plants without the aid of insects. A single plant of *Linum Lewisii*, on the other hand, in all probability could propagate itself, even if no insects were present, as probably sometimes occurs in its Arctic home. If insects visited the plant, the flowers which were dimorphic would be fertile one with another or with those on any neighbouring plant. Thus the plant would receive the advantage of a cross.

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* Hooker's London Journ. of Botany, 1848, vol. vii. p. 175. It is not improbable that the allied genus *Hugonia* is dimorphic; for (p. 525) one species is described "staminibus exsertis;" another has "stamina 5, majora, stylos longe superantia;" and another is furnished "stylis staminibus longioribus."

That this is an advantage, and is one great end gained by reciprocal dimorphism, I can entertain no doubt. That in some cases this dimorphism may be a step towards a complete separation of the sexes, I will not dispute; but good reasons could be assigned to show that there is no necessary connexion between reciprocal dimorphism and a tendency to diœcious structure. Although good is gained by the inevitable crossing of the dimorphic flowers, yet numerous other analogous facts lead me to conclude that some other quite unknown law of nature is here dimly indicated to us.

On the Form of the Vascular Fasciculi in certain British Ferns. By Arthur H. Church, B.A. Oxon. Communicated by W. Francis, Ph.D., F.L.S.

[Read Dec. 18, 1862.]

The distribution of the vascular tissues in the stem and stipes of the British species of Ferns has been made the subject of much interesting and accurate study by Dr. Ogilvie*. His papers are to be found in the 'Annals and Magazine of Natural History' for December 1859 and November 1860. My own long-continued examination of the living plants has not enabled me to detect any but the most trivial mistakes in these full and admirable memoirs. I have therefore only to propose a few slight alterations in Dr. Ogilvie's conclusions, and to make one or two additional remarks on certain species and varieties which he omits to notice. The present communication may be deemed the first instalment of such supplementary observations. I may also here state that I can confirm the general accuracy of Duval-Jouve's figures so far as they relate to species found in Britain.

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* The following list of papers includes nearly all those in which the vascular tissues of Ferns have been discussed:—

Presl. Tentamen Pteridographiæ. Pragæ: 1836.
Fée. Die Gefässbündel im Stipes der Farne. Pragæ: 1847.
Ogilvie, Dr. Ann. & Mag. Nat. Hist. 1859 and 1860.
Duval-Jouve, J. Etudes sur le Pétiole des Fougères. In Billot's Archives de la Flore de France; pp. 57 & 149.
King. On Sigillaria. Edinburgh Phil. Trans. 1844.
Leighton, Rev. W. A. Hints on a new character in Ferns. Phyt. n. s. i. p. 256.
Moore, T. The Vascular Bundles of the Stipes of Ferns. Phyt. n. s. i. p. 378.
Reichardt, H. W. Ueber der Gefässbündel Vertheilung im Stamme und Stipes der Farne. Denkschriften der Kaiserlichen Akademie der Wissenschaften, xvii^{ter} Band. Wien: 1859.

To discuss the difficult question of the nomenclature of these plants is beside my purpose; I shall therefore do no more than designate each form named by two or three of its best-known synonyms. At the same time, it seems that the results of such inquiries as the present, as possibly affording criteria of generic if not of specific difference, cannot be wholly disregarded, and may ultimately aid us in arriving at a more consistent classification for the Filices.

The genera *Polystichum* and *Lastrea* as understood by Moore and many other authors are respectively coextensive (so far as our native ferns are concerned) with the genera *Aspidium* and *Nephrodium* adopted by Hooker in his 'British Ferns' (1862). I have examined transverse sections of the stipes of all the generally received species and many of the varieties included under these generic appellations, and in two species only did I find any material departure from that one particular arrangement of the vascular fasciculi which is disclosed by a transverse stipital section of such a form as Moore's *Lastrea Filix-mas* or *Polystichum Lonchitis*. In *Nephrodium Filix-mas*, *N. rigidum*, *N. cristatum*, *N. spinulosum* α. *bipinnatum*, β. *dilatatum*, γ. *æmulum*, δ. *dumetorum*, *Aspidium aculeatum* α. *lobatum*, β. *intermedium*, γ. *angulare* of Hooker, and also in the forms *Lophodium glandulosum*, *L. uliginosum*, *L. nanum*, and *L. collinum* of Newman, the same disposition of the vascular tissue occurs. The two notable exceptions to which I have before alluded are found in *Nephrodium Thelypteris* and *N. Oreopteris* of Hooker, identical with the *Lastrea Thelypteris* and *L. montana* of Moore and the *Hemestheum Thelypteris* and *Lastrea* (*Hemestheum*) *montana* of Newman. In fig. 1 the prevalent arrangement is shown; in fig. 2 that which occurs in the mountain fern; while fig. 3 represents that of the marsh fern, which I will now more particularly describe. In all cases the sections noticed are those of the stipes, not of the stem; and I have freely availed myself of the use of a very weak solution of perchloride of iron, in order that the tracts containing tannin might be distinctly marked out.

Nephrodium Thelypteris, Hooker.
Hemestheum Thelypteris, Newman.
Lastrea Thelypteris, Moore.

The present plant is not only closely connected in many of its external characteristics with *N. Oreopteris*, but also greatly resembles that species in the form and arrangement of the vascular bundles of its stipes. For instance, in a fertile frond, 26 inches long, which I examined, where the stipes measured 12 inches, though the vascular tract could be clearly traced sending a branch of a greenish tint into each pinna, yet there was no sign of the prolongation of the dark sheath so conspicuous in each vascular bundle of the stipes in this fern, and which is an almost invariable element in the other British *Nephrodia* (*Lastreæ*). Now the dark sheath is not partially only, but entirely wanting in *N. Oreopteris*. Figs. 4 *a*, 4 *b*, 4 *c*, and 4 *d* represent transverse stipital sections made respectively at the junction of stem and stipes, and at 3, 6, and 9 inches above that point; figs. 4 *e* and 4 *f*, similar sections at further intervals of 1½ inch. It will be seen that the two large oval vascular bundles have coalesced at 10½ inches from the origin of the stipes, and 1½ inch below the first pair of pinnæ. At and near the origin of the stipes its cortical layer is thick, dense, and dark, as shown in 4 *a*. Above, as the dark sheaths of the fibro-vascular bundles are more marked, and their constituent cells more lignified by secondary deposits, so the cortical layer becomes paler and thinner: this observation has been made frequently with reference to other species of ferns. In figs. 1, 2, & 3, a remarkable difference in the arrangement of the scalariform ducts in the midst of the smaller cells of the fibro-vascular bundles is noticeable. These spiral-fibrous or, rather, scalariform ducts are arranged for the most part, both in *Nephrodium Thelypteris* and in the closely allied species *N. Oreopteris*, in the form of the Greek letter Σ,—the more usual form being that shown in fig. 1, which is, with slight variations, common to all the other British *Nephrodia* and *Aspidia**. Here, all the larger cells of the two main fasciculi† near the axis of the stem are grouped together in an irregular oval or pear-shaped figure, from one extremity of which an incurved prolongation proceeds†. The thickened cells of the cortical layer and of the dark sheath are of nearly equal size, and far less in transverse diameter than the general parenchyma of the stem. They are alike stained black when moistened with perchloride of iron, owing to the presence in them of tannin.

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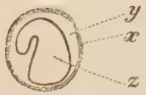
* In the genus *Lastrea*, *L. recurva* (*Fœnisecii*), with its very compound fronds of almost deltoid outline, its dark ramenta, and the trilobed outline displayed by a transverse section of its stipes, passes, by nearly insensible gradations, through *Lastrea dilatata* and its slightly divergent varieties,—through Mr. Westcombe's new form *L. Scotica*,—through the forms *L. glandulosa*, *L. spinulosa*, and *L. uliginosa*, to *L. cristata* with its simpler narrow fronds, its pale concolorous ramenta, and its quadrangular section,—the disposition of the vascular fasciculi remaining nevertheless nearly identical in the whole series.

† In the British Lastreas, &c. (excepting, of course, *L. Oreopteris* and *L. Thelypteris*), the *number* of the fasciculi, though never less than three, is by no means a constant character, sometimes as many as eleven or thirteen being found in a large and vigorous frond. Frequent branching and anastomosing of the

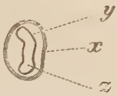
Fig. 1.



× 5.

Transverse section of one of the two larger vascular fasciculi of the stipes of *Nephrodium Filix-mas* (var. *Borreri*).

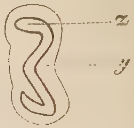
Fig. 2.



× 5.

Transverse section of one of the two fasciculi of the stipes of *N. Thelypteris*.

Fig. 3.

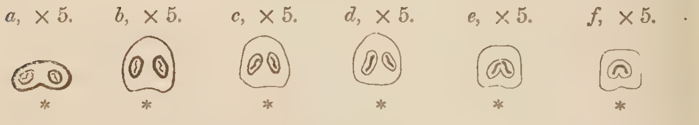


× 5.

Transverse section of one of the two fasciculi of the stipes of *N. Oreopteris*.

The perchloride of iron, as a general rule, darkens the cortical layers and the immediate envelope of the central scalariform vessels.

Fig. 4.



Nephrodium Oreopteris, Hooker.
Hemestheum montanum, Newman.
Lastrea Oreopteris, Moore.

Dr. Ogilvie states that *N. Oreopteris* has two vascular bundles in its stipes, and that there is a tract of dark tissue upon that aspect of each bundle which looks towards the axis of the stipes. I have dissected numerous large and mature specimens of this fern, but have never been able to discover a trace of dark tissue

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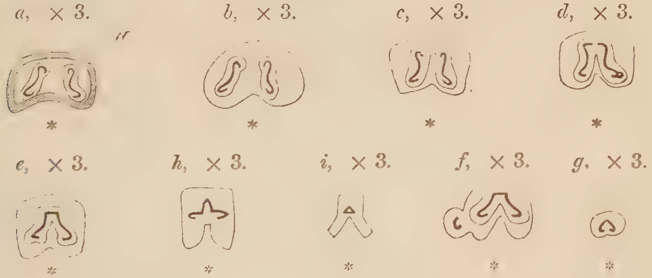
bundles in a stipes occurs, so that a section of a stipes may disclose more bundles at some part of its upper extremity than at its base, and *vice versâ*. In *Lastrea dilatata* (*Lophodium multiflorum*, Newm.) and its nearest allies, the irregularities in this respect are more pronounced than in *L. cristata* (*Loph. callipteris*).

† Throughout the figures in the present paper an asterisk indicates the axis of the stem; while the letters x, y, z refer to the dark sheath, to the small cells, and to the large scalariform vessels of the vascular bundles, respectively: the cortex, if given, is marked w.

in the interior of the stipes, though its strong cortical layer is thick and deeply coloured. The vascular bundles also differ in form very strikingly from those of allied species (excepting *N. Thelypteris*). Figs. 5 *a*, 5 *b*, and 5 *c* represent stipital sections made respectively at the junction of the stem and stipes, at midway between that point and the origin of the first pair of pinnæ, and at a short distance below the first pair. The central portion of each fasciculus has a form still more closely resembling that of the Greek Σ than does the corresponding part in *N. Thelypteris*; it is conspicuous from its whiteness, and consists mainly of large scalariform ducts. Fig. 5 *d* shows the approach of the bundles above the origin of the second pair of pinnæ, while 5 *e* shows their junction after the seventh pair. The appearance of the rachis after the twelfth pair is given in fig. 5 *h*; a leafy wing to the rachis originates after the sixteenth pair of pinnæ, and is represented in fig. 5 *i*. Figs. 5 *f* and 5 *g* illustrate the origin[†] and form of the vascular bundle proceeding to the eighth pinna. This partial bundle originates in precisely the same manner as the partial bundle in *Osmunda regalis* described (for the sake of elucidating this point) further on.

Fig. 5.

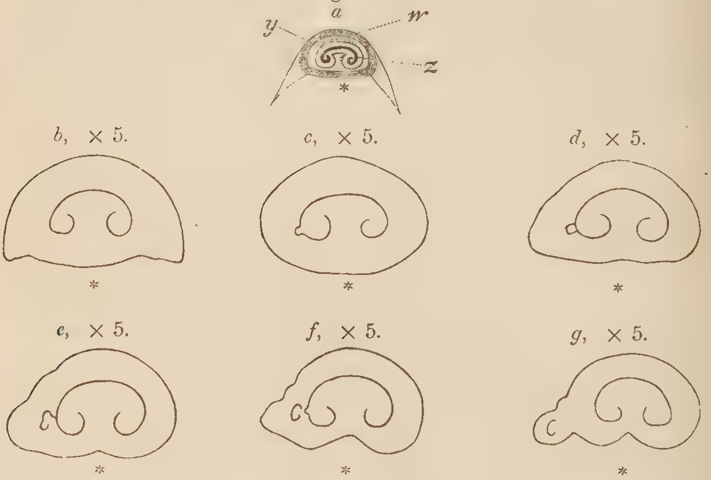


Osmunda regalis.

The disposition of the vascular tissue in the stipes of *O. regalis* is remarkably different from that of the other ferns which I have described. Dr. Ogilvie's account is accurate in the main. I will therefore here merely direct attention to a series of diagrams illustrating the structure of the stipes, &c. at different points. Fig. 6 *a* shows the stipes, of the natural size, at its insertion into the stem, and discloses on the exterior two wings of soft white cellular tissue, the cortical layer, and the interior parenchymatous tract in which the vascular bundle lies. This bundle has the form of a crescent, each end of the crescent being a volute. On the *convex* side of the crescentic fasciculus, and away from the axis of the stem, a few small dark tracts may be observed, and occasionally two or three others may be detected on those aspects of the volutes which most nearly approach. [Dr. Ogilvie finds the dark tracts on the concave aspect of the fasciculus: I have never observed this.] These dark tissues are hardly to be distinguished from true woody fibre. Figs. 6 *b*, 6 *c*, 6 *d*, 6 *e*, 6 *f*, 6 *g* are diagrams intended to trace the origin of the vascular bundle which branches off to the first pinna. Not only do the various foreign forms of this plant exhibit the same disposition of the vascular tissue in the stipes, but an identical arrangement in species of *Osmunda* generally thought to be distinct, such as *O. Claytoniana*.

[†] The term 'origin' is employed in reference to the actual state of the vascular cord at different parts of the stem at the same time—to its condition in space, not to its development in time.

Fig. 6.

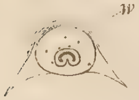


b, × 5. *c*, × 5. *d*, × 5.

e, × 5. *f*, × 5. *g*, × 5.

Todea, the other genus of Osmundaceæ, ought to show some analogy in the form of its vascular bundles with that of *Osmunda*. A transverse section of a young frond of *T. Africana* (fig. 7) disclosed a row of scalariform vessels arranged as a crescent, closely resembling that of *Osmunda regalis*, but simpler. As in *O. regalis*, the fascicle had no dark sheath, but a few black fusiform woody fibres interspersed sparingly in the simple parenchyma of the base of the stipes: a white, soft and

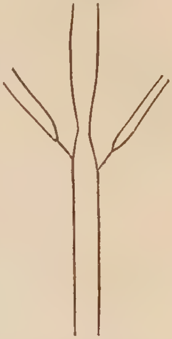
Fig. 7.



fibrous wing on either side of the base of the rachis is another point of resemblance to *Osmunda*.

Gymnocarpium Phegopteris, Newman.
Polypodium Phegopteris, Hooker, Moore.

Fig. 8.



Two vascular bundles* with dark sheaths traverse the stipes, in the foci of whose ellipse they are situate. As the first pair of pinnæ do not originate exactly opposite one another, one of the vascular bundles branches off before the other, sending off into the lowest pinna a single branch, which soon divides into two—these continuing almost to the apex of the pinna: the same phenomena are to be noted with reference to the other vascular cord, and, in both, are repeated to the apex of the frond. Just after each branching of the main cords they approach, but soon recover their relative position. (See fig. 8.)

A few words in conclusion as to the special bearings of the present inquiry. First, it may be affirmed that the disposition of the vascular tissue in all the British varieties and indistinct species of Hooker's genus *Nephrodium* is nearly alike. Secondly, that there is no marked distinction between the genus *Aspidium* (*Polystichum*, M.) and the genus *Lophodium* (*Lastrea*, M.) in this particular. (I have examined many foreign species of *Polystichum* with the same results.) Thirdly, that the genus *Lastrea* of Moore contains two British species (and many foreign ones) which possess a totally different arrangement of their vascular tissue, and that this fact, taken in connexion with the other previously recognized outward differences of these *very same* species, almost warrants their removal to another genus. And fourthly, that genera whose outward characteristics are conspicuously distinct, exhibit marked differences in the arrangement of their vascular fasciculi, while closely allied genera do not.

I will not weary the Society with further details, but beg it to accept the present communication as a small selection from those results at which several hundred observations have enabled me to arrive.

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* In *Polypodium Phegopteris* a close approach to the sigmoid figure in the vascular bundles of *L. Oreopteris* and *L. Thelypteris* is made. The same observation applies to the foreign species *P. hexagonopterum*, and, with modification, to the genus *Onoclea*. The genus *Asplenium* includes two or three apparently distinct arrangements, and demands more complete examination.

Notes on the *Loranthaceæ*, with a Synopsis of the Genera. By DANIEL OLIVER, F.L.S., Professor of Botany, University College, London.

[Read January 15, 1863.]

I HAVE been engaged for some time upon an examination of the Loranthaceæ; and as it is my intention to continue their study chiefly with reference to certain analogies which they present with Gnetaceæ, I venture to lay before the Linnean Society some notes which I have accumulated upon the genera of the Order, which may be useful to botanists working them up in further detail. A Synopsis of the genera follows these notes.

I do not enter, at present, upon the relationship which every one acknowledges to subsist between the Loranthaceæ and Santalaceæ. My opinion strongly inclines to their union as subdivisions of one Order. Indeed M. Baillon may be right in proposing that both Olacineæ and Santalaceæ be united with Loranthaceæ[*]. As, however, in any arrangement based upon the Candollean sequence it would be impossible to arrange these groups consecutively—one Thalamifloral, another Calycifloral, and the third Monochlamydeous,—I fear we shall be apt to follow the more convenient course and keep them apart as hitherto. In the present notice I have omitted *Myzodendron*, which cannot be included in Loranthaceæ as distinct from Santalaceæ, any more than *Henslovia* and an Indian leafless parasite in Sir W. J. Hooker's herbarium, the name of which is uncertain. Mr. Miers's proposal to separate *Myzodendron*, with *Viscum* and some allied genera, from *Loranthus*, erecting them into a distinct Order, *Viscaceæ*[†], rests, I believe, chiefly upon an incorrect view of the structure of the ovary and fruit in these plants. Since the recent researches of Hofmeister into the embryogeny of *Loranthus*, *Viscum*, and *Lepidoceras*[‡], no doubt can remain that these are all characterized by a single erect ovule, often almost entirely adnate with the wall of the ovary. My own observations confirm this view. As is shown by Hofmeister, there has been much confusion of embryo-sacs with ovules by observers. The plants referred by Korthals to *Tupeia* with pendulous ovules (*vide* Mr. Miers in Lindl. Veg. Kingd. 791 *c*) are species of *Henslovia*, as stated by Blume[§]. Mr. Miers describes the embryo of Loranthaceæ, distinguished from Viscaceæ, as "enclosed in thin, almost pellicular albumen, filling the cell," and the fruit as "containing a subcoriaceous putamen." *Loranthus* is figured by Blume, Griffith, and others as with abundant albumen; and so I find it in the seeds of the Indian species which I have examined. In *L. europæus*, too, it is abundant. I cannot doubt, therefore, that Mr. Miers has had old or decayed fruits for examination, in which the albumen had shrivelled up from the enclosed embryo, and that the albumen has been taken for a layer of the pericarp (putamen).

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[*] Adansonia, ii. 380.

[†] Ann. Nat. Hist. ser. 2. viii. 179; and Lindley, Veg. Kingd. 791 *c*.

[‡] Transl. in Ann. Sc. Nat. 4ᵉ sér. xii. 9.

[§] Mus. Bot. i. 243.

In the notes and technical descriptions which follow, I speak of the *calyx* and *corolla* of *Loranthus*, and the *perianth* of *Viscum* and the genera allied to it. I am fully aware of the reasonable objections to this application of terms, but I apprehend they are as little likely to be misunderstood as any I could employ for the purposes of the present communication.

LORANTHUS, *L.*

I have revised the Sections of this large genus as established by Blume, DeCandolle, and Martius, though without a result so satisfactory as I could wish. The divisions of these botanists must furnish the basis of any distribution of the species into natural groups, although the sections of Von Martius appear to have been drawn up with reference too exclusively to Brazilian forms, those of Blume to Asiatic and Archipelago species. I feel convinced that generic value cannot be attached to any of these sections; the principal structural characters upon which they rest applying chiefly to the cohesion of the petals, the number of bracts to each flower, whether one or three, and the form of inflorescence. The more important character afforded by the mode of attachment of the anther to the filament, and which, like the Atlantic, separates the species of the New from those of the Old World, though not without exceptions on both sides, does not appear of such great absolute value in itself as to serve as a mark of generic distinction. The basifixed or versatile anthers I do not find associated generally with any particular set of minor characteristics serving to endorse a generic validity. Some forms differing in this particular, are in other respects nearly the same. Neither do I believe the form of the anthers available for the grouping of species except in a subordinate way, though in two or three sections they are certainly very different from the rest. The genus, as *Loranthus*, is a good and natural one—well-defined and easily recognized; but if broken up, it will be found, as in other too familiar instances, that though many of our genera are recognizable by artificial characters, and some form natural though not always well-defined assemblages of species, yet others would be less favoured, and, without a reference to geographical distribution, not easy to limit or make out. Geographical distribution I conceive to be available only for the artificial distribution of species, &c. for convenience of reference, not for the higher purposes of study. I have endeavoured therefore to be little influenced by it; nevertheless it will be seen that, generally, the distribution of the species of each group is comparatively circumscribed.

VISCUM, *L.*

It is interesting to note that the species having persistent perianth-lobes all belong to the aphyllous group, and, excepting perhaps one or two from the mainland of Asia, are confined to the Archipelago and islands of the Indian and Pacific Oceans.

GINALLOA, *Korthals.*

I have not seen authentic specimens, but I have no hesitation in identifying a few leafy species from the Indian Archipelago, having the flowers in axillary or terminal articulated spikes, with this genus, which, I apprehend, must be maintained on the ground of its free anthers (*i. e.* not adnate to the perianth-lobes), not chambered as in *Viscum*, but either truly two-celled and subdidymous, or opening along the connective on the inner face of the anther. I have had but few male flowers in a state fit for examination, so that possibly further observation may lead to a modification of the generic diagnosis in order that the species which I describe under *Notothixos* may be included in this genus. The *Viscum floccosum* of Mr. Thwaites, with the habit of *Ginalloa*, has the anthers of *Notothixos*. A second Ceylon species, *V. spathulifolium*, Thw., from its very close resemblance to Malayan specimens of *Ginalloa*, I have little doubt must belong to Korthals's genus, though I have not access to staminate flowers to enable me to decide the point.

NOTOTHIXOS, gen. nov.

Viscum cornifolium, Cunningham, *V.? subaureum*, F. Mueller, and *V. incanum*, Hook., from Eastern Australia, I propose to separate generically. They differ from *Viscum* in habit and in the anthers, which are free, more or less reniform, transversely lobed by a faint sutural line, and each lobe obscurely chambered as in some African species of *Loranthus*. This transverse chambering of the anthers is distinct in *N. cornifolius*. From their minuteness in the other species it is with difficulty discernible. In *N. floc-*

cosus the anthers in bud resemble those of *Viscum*; but they are free, and I doubt if the dehiscence be by pores as in that genus. The stellate pubescence of this Ceylon plant is similar to that of two of the Australian species.

ARCEUTHOBIUM, *Bieberst.*

The bifid perianth of the ♀ flowers, which are terminal, or opposite in the axils of the sheaths, distinguishes this genus from *Phoradendron*. I cannot agree with Prof. Grisebach in referring to *Arceuthobium* the West-Indian species described in his 'Flora of the British West Indies' (p. 315). They appear to me undoubtedly aphyllous species of *Phoradendron*.

PHORADENDRON, *Nutt.*

I have not undertaken to arrange subdivisions of this large genus; they will form an interesting study for the botanist who may have to elaborate the Loranthaceæ of the 'Flora Brasiliensis.' The leaves are wanting, or reduced to squamæ, in but few species. The anthers are described as two-celled; and so they usually are in some species, for example in *Ph. flavescens* of the United States; but in others they are certainly one-celled, probably by confluence of the pores or slits of dehiscence. Indeed, in *Ph. flavescens* I have found the anthers occasionally thus one-celled. I have therefore modified the diagnosis in this regard. The species with one-celled anthers, referred to *Arceuthobium* by Dr. Grisebach in his 'Flora of the British West Indies,' appear to me to belong properly to *Phoradendron*. His *Ph. buxifolium* (Pl. Cubenses, 220) and *Ph. serpyllifolium* (Wright, Pl. Cub. no. 1254) have certainly one-celled anthers. A few leafless or nearly leafless species much resemble *Arceuthobium* at first sight, especially those which have the floriferous internodes excessively short and only two-flowered, the flowers being almost or quite in the axils of the sheaths. The flowers are, however, more or less immersed in the rachis, and have three-lobed perianths. The *Castrea falcata* alluded to by St. Hilaire (Leçons, p. 451, and fig. 335) I presume must be a *Phoradendron*.

ANTIDAPHNE, *Poeppig.*

To this imperfectly described genus I refer a Venezuelan plant with ♀ flowers collected by Fendler, and another (♂) by Seemann in Veraguas. I feel no doubt these belong here, having a Peruvian specimen of the original *A. viscoidea* in the Hookerian herbarium, besides Poeppig's rather imperfect figure of it, to guide me. The northern plants are probably distinct species, judging from the venation of the leaves. I am enabled by their aid to correct some inaccuracies in the generic description, which have been adopted by Endlicher, who, after Poeppig, describes the ♂ flower as "tubo filiformi," and with stamina "limbi laciniis alterna." The "tubus" is the pedicel; the "laciniæ," the lobes of a thickened disk. In Seemann's ♂ plant I observe a pair of setiform bract-like processes, which I was in doubt whether to regard as lateral bracteolæ or reduced perianth-segments. As they appear to be opposite to stamens, I conclude they are the latter. The Peruvian plant appears destitute of them. In this genus, as also in *Lepidoceras*, I have noted interesting relations to subsist between the *Nieder-*, *Laub-*, and *Hoch-blätter* of Braun. In describing these, I shall employ the terms used by Mr. Henfrey, derived from Greek roots, viz. *cata-*, *eu-*, and *hypso-phyllary* (scale, foliage-leaf, and bract) leaf-formations. The spikes of both ♂ and ♀ flowers found in the axils of the leaves or clustered about the apices of the branches are at first strobilus-like, covered with numerous dry imbricating scales, the lowermost of which are empty and truly cataphyllary. These pass into others quite similar in structure, though larger, subtending the flowers. After these and continuous with them, though with rather abrupt transition in respect to texture and duration (for the dry scales are caducous), come the young euphyllary leaves, which unfold themselves as the spike elongates. We thus always find the young fruits scattered along the lower, bare portion of the shoots, the bracts having long since fallen away. The upper portion bears the leaves, in the axils of which these formations are repeated. I must refer to *Lepidoceras* for a case somewhat similar, though in some respects more remarkable. Compare also the account of the ramification, &c. of *Myzodendron*, by Dr. Hooker (Flora Antarctica, ii. 290).

EUBRACHION, *Hook. fil.*

It is unfortunate that I am unable to add more to our knowledge of this rare and curious plant. It will be seen in the appended Synopsis that we do not possess technical characters of importance to distinguish it. In habit the plant looks very different from any of its allies. Anyone visiting Uruguay will do well to have an eye to it.

LEPIDOCERAS, *Hook. fil.*

The two species originally described briefly by Dr. Hooker in the 'Flora Antarctica' are the only ones known to me, the

L. punctulatum of Clos in Gay's 'Fl. Chilena' (iii. 163) having been separated by Prof. Grisebach. Clos ought not to have united the two species of Dr. Hooker; they look distinct, and are so held by Grisebach (Pfl. Phil. und Lechl. 23). The proportionally large embryo and reduced albumen in this genus, pointed out by Grisebach and Hofmeister, offer a remarkable feature in the Order. I have seen nothing like it in allied, or indeed any Loranthaceæ. If I understand Hofmeister's figure rightly (Ann. Sc. Nat. 4ᵉ sér. xii. t. 3. fig. 32), the membrane of the conical body *g* answers to the 'endocarp' in *Viscum* of Decaisne, which he describes "sous la forme d'une pellicule verdâtre . . . . . parcourue par un réseau vasculaire," and is no part, I think, of the ovule proper, as Hofmeister regards it, although enclosing and (as in *Viscum* at first) entirely adnate with it*.

I have alluded to the relations of the bud-scales, leaves, and bracts in *Lepidoceras* while speaking of *Antidaphne*. My attention was directed to them by the explanation which I stumbled upon of the remarkable scaly tips of the leaves from which the genus derives its appellation. The young ♀ flowers are found in small axillary strobili formed of numerous dry imbricating scales. The outermost and lowest of these scales, as in *Antidaphne*, are empty and truly cataphyllary; the succeeding (hypsophyllary) scales subtend the flowers. These, however, are not caducous, as in that genus, but persistent. As the axis of the cone grows out, the hypsophyllary scales (bracts) become borne up on the apices of the euphyllary or ordinary leaves of the plant by the development of a true lamina continuously with the base of each. The scaly bracts persist, crowning the extremity of the leaves, sometimes separated from them by a constriction, which answers to the narrowed base or petiolar portion of the scale while doing duty as a bract. The scales subtending the ♂ flowers are early deciduous, though, as the leaf-buds are scaly, we find the developed leaves, as in the ♀ plant, terminated with dry scales.

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* With regard to this so-called 'endocarp,' which in most species of *Viscum* and *Phoradendron* is readily separated from the rest of the ripe pericarp by simply squeezing the latter when separated from its peduncle, I feel inclined to believe that it has much in common with a corresponding layer, not however thus easily separable, in *Gnetum*, *Welwitschia*, *Ephedra*, and perhaps other Gymnosperms. In *Viscum* and *Phoradendron* (which appear to have the nucleus always more or less adnate to the wall of the ovary) we find this membrane separating the seed from the viscine cells of the pericarp, with which its outer surface is organically continuous. It is usually (?) traversed vertically by two principal conspicuous bundles of vessels, which often branch a little above. In many cases, however, more than two bundles traverse it: sometimes they are numerous and anastomose, as in *V. album*. When several are present, they may, sometimes at least, be found to converge at the base towards two opposite points. I hope to return to the consideration of this layer at a future time.

EREMOLEPIS, *Grisebach.*

The appended Synopsis shows that I have had imperfect material for the study of this genus, having access only to ♂ flowers of *E. verrucosa* and ♀ of *E. punctulata*. The former are in small axillary strobili, each flower in the axil of a scale-like deciduous bract, and enclosed by two lateral bracteoles (absent in *Lepidoceras*). The perianth I always find 5-partite. As Grisebach describes *Eremolepis* (♂) with '*calyx tripartitus*,' he may have borrowed this character from the figure in the Atlas to 'Fl. Chilena.'

The bark of *E. verrucosa* is studded all over with minute papillæ, which, when traced up the petioles and to the lamina of the leaves, appear to be due to an altered condition of the stomata. This recalls the parallel case of *Myzodendron*, in which genus, as in *Eremolepis*, we have a single species differing from its congeners in the presence of these remarkably hypertrophied organs. *M. punctulatum*, however, being aphyllous, does not so readily permit the observation of a graduated series between the normal and tubercular stomata. The leaves, as observed by Grisebach, are destitute of apical squamæ. I doubt if the Cuban plant of Wright be correctly referred here by Prof. Grisebach in his 'Plantæ Wrightianæ,' 192. The plant is monœcious, though not so described. The perianth-lobes of the ♀ flower are persistent; and there are some other points of difference. I do not venture to separate it under a new name. We must await further discoveries before finally settling what to do with it.

GENERA OF LORANTHACEÆ.

1. NUYTSIA, *R. Br.*

Fructus monospermus, siccus, trialatus. Embryo cotyledonibus 3–4 inæqualibus.

N. floribunda, R. Br., we have from Murchison River, Swan River, and King George's Sound. Of the *N. ligustrina*, A. C., of Mueller's 'Fragmenta,' ii. 130, from New South Wales, no fruit has been seen that I am aware of. It remains therefore a doubtful congener.

2. LORANTHUS, *L.*

A. Antheræ dorso affixæ (in speciebus plurimis sectionis *Struthanthi* parvæ, prope basin affixæ).—*Notanthera*, A. P. De-Candolle, Mém. Loranth. 17.

I. Flores parvi, sessiles, singuli in fovea rhacheos inserti, vel in axillis foliorum dense congesti, bractea bracteolisque minutis abortivisve.

a. Inflorescentia spicata.

§ 1. *Oryctanthus*, Griseb. Fl. Brit. W. Ind. 313.

Bracts at first imbricating, at length obsolete or, with the bracteoles, as minute scales in the depressions. Anthers usually alternately shorter, and, especially the shorter ones, minutely apiculate. The connective is sometimes dilated in front, sometimes narrow. The petals are free. The spikes in some species much abbreviated. —(*Euloranthus* § *Stachyanthi*, DC., in part*.)

Hab. Mexico, Panama, W. Indies, Columbia and New Granada, N. Brazil.

b. Flores dense glomerati v. fasciculati, axillares.

§ 2. *Phthirusa*, Mart. Regensb. Flora, 1830, 110.

The flowers I find 4–6-merous, and the connective, at least in some species, apparently adnate to the petals.

Hab. Brazil.

II. Flores pedicellati v. sessiles, singuli bractea bracteolisque tribus sejunctis vel connatis vel bractea cupuliformi fulti.

a. Flores parvi, 6–5-meri, in racemis axillaribus. Stamina filamentis brevibus subnullisve.

§ 3. *Dendropemon* et *Lipotactes*, Blume, Fl. Jav. Loranth. 13.

The flowers are sometimes nearly sessile and spicate. Bract and bracteoles confluent, forming small 3-lobate or entire cupules. Petals usually 6, at length free. Stamens alternately longer. Anthers often reniform and apiculate. *L. pauciflorus*, Sw., the only species of Blume's Section *Lipotactes*, does not differ materially from the rest. The anthers are not quite sessile.

Hab. W. Indies.

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* I refer here also *Spirostylis*, Presl (Schultes, Syst. Veg. vii. 163). Mr. Bentham's *Loranthus Grahami* (Pl. Hartwegianæ, 62) is the only species I have seen; and I think it probably the same as Schultes described.

The flowers seem 1-sexual by abortion; the anthers being imperfect in the ♀, and the style straight and reduced in the ♂. I scarcely think the twisting of the style is of sectional importance. The flowers are rather larger than in § *Oryctanthus* generally, being near $\frac{1}{4}$ in. in length.

The *L. diversifolius*, Benth. Pl. Hartweg. 63, I am at a loss to know what to do with, unless I leave it here for the present. Each flower has a small subcupulate bract, which is sometimes reduced to a mere ring.

b. Flores in corymbos v. paniculas cymosas vel racemos compositos terminales v. axillares, raro in racemos simplices v. spicas dispositi, in speciebus paucis solitarii v. geminati axillares, sæpius 1–3 unc. longi.

§ 4. *Psittacanthus*, Mart., et *Tristeryx*, Mart. Reg. Flora, 1830, 15. 17.

The Eastern species with basifixed anthers included in *Tristeryx* and *Psittacanthus* by Martius are, of course, excluded. As the cupule supporting the flower in *Psittacanthus*, Mart., in many, if not in all, cases appears to result from the coalescence of three organs, viz. the bract and two bracteoles, I am not able to make a separate section of his *Tristeryx*, in which the bracts are free or only partially connate. *Loranthus aphyllus* of Mr. Miers is very near to *L. tetrandrus*, R. & P., the only species retained in *Tristeryx* by Blume. The petals are at length usually free.

Hab. Mexico, Central America, West Indies, Brazil, Uruguay, and Western S. America to Chili.

III. Flores "subternatim dispositi totidemque bracteis suffulti."

a. Flores sessiles aut raro subsessiles, sæpius parvi.

§ 5. *Struthanthus*, Mart. Reg. Flora, 1830, 102.

Flowers in terminal or axillary racemes or racemose panicles, seldom over $\frac{1}{3}$, rarely $\frac{1}{2}$ in. long. (*Euloranthus* § *Protostelides*, DC. *Passowia*, Karst. in Bot. Zeit. 1852, 305.)

Hab. W. Indies, Panama, Mexico, Guiana, Venezuela, Brazil, Uruguay, and Western S. America to Chili.

b. Flores subternatim dispositi, pedicellati vel centrali sessili, singuli 1-bracteati, bractea calycem frequenter superante plus minus foliacea raro 0. (Flores in speciebus paucis in racemis terminalibus subterni v. alterni bractea cucullari calycem sæpe superante.)

§ 6. *Taguana.*

Including the '*Oscillantheræ Taguanæ*' of M. DeCandolle, referred to *Struthanthus* by Blume, and *Gaiadendron* of Don, Gen. Syst. iii. 431. They seem to form a distinct natural group with terminal inflorescence and rather large flowers.

Hab. S. America: New Granada, Columbia, Peru, Chili, and S. Brazil.

A few E. or S.E. Australian and Polynesian species I refer here for the present, including *L. eucalyptoides* and *L. celastroides.* These do not consort well with the American species.

IV. Antheræ dorsofixæ, immobiles.

§ 7. *Loxanthera,* Blume, Fl. Jav. 15.

This curious mode of attachment of the anther appears confined to one or two species of the Indian Archipelago and Malacca. It is well figured by Blume, *op. cit.* t. 23. *c.* Of the Malacca plant I have seen flowers only.

B. Antheræ basifixæ v. adnatæ.

I. Flores singuli tribracteati (bractea 1, bracteolis 2).

a. Flores singuli in foveam rhacheos leviter inserti, in spicis axillaribus paucifloris decussatim oppositi, bracteis primum tecti.

§ 8. *Elytranthe,* Blume, Fl. Jav. Loranth. 16.

Petals 5-6, connate below.

Hab. India.

b. Flores pedicellati v. sessiles, sæpius racemosi aut cymosi, axillares, interdum in nodis subsessilibus.

§ 9. *Macrosolen,* Blume, Fl. Jav. Loranth. 16.

Petals 5–6, united below, or sometimes free. (*Symphyanthus* § *Anguliflori,* DC.)

Hab. India.

II. Flores capitulatim congesti, bracteis numerosis imbricatis involucrati. Petala 6 coalita.

§ 10. *Lepeostegeres,* Blume, Fl. Jav. Loranth. 18.

A very remarkable and distinct section, so far as inflorescence is concerned. In a plant from the Philippines the bracts seem considerably fewer than in the other species.

Hab. Borneo, Java, Philippines.

III. Flores 4–6, congesti, bracteis totidem distinctis v. involucro 1-phyllo coalitis cincti.

§ 11. *Tolypanthus,* Blume, Fl. Jav. Loranth. 18.

L. lageniferus, figured by Wight (Ic. 306), is the only species I know in which the bracts form a monophyllous involucre.

Hab. India.

IV. Flores sæpius pedicellati, singulatim 1-bracteolati. Petala coalita. (*Dendrophthoë*, Mart. Reg. Flora, 1830, 109.)

a. Flores sæpius 4-meri. Ovarium demum obconicum v. clavatum.

§ 12. *Cichlanthus*, Endl. Gen. Pl. 802.

Hab. India and the Archipelago.

b. Flores sæpius 5–6-meri, corolla subinde lateraliter fissa. Ovarium basi rotundatum.

§ 13. Subsect. i.

Eudendrophthoë, Endl. *l. c.*—Flores sæpius racemosi vel racemis reductis abbreviatisve geminati v. fasciculati, raro solitarii aut in speciebus perpaucis (*L. sclerophyllus*, Thw. &c.) umbellati, corolla basi nunquam inflata.

Hab. India and the Archipelago. Australia.

c. Flores 5 (rarius 4) -meri, axillares, geminatim ternatimve fasciculati, interdum solitarii aut umbellati, raro racemosi, pedicellati v. sessiles, singuli unibracteati.

§ 13. Subsect. ii.

(*Tapinanthus*, Blume, Fl. Jav. Loranth. 15, in part ?)

The corolla is frequently much dilated at the base, the cells of the anthers in some species multilocellate, and the filament often more or less produced at the base of the anther. I do not find that these afford sectional characters.

Hab. Africa: Abyssinia, West Tropical Africa, Cape, Natal, &c.

d. Flores 4-meri, racemosi, bracteis minutis obsoletisve.

§ 14.

L. flavidus, Hk. f., of New Zealand.

V. Flores 5-meri, geminatim v. umbellatim dispositi, singuli 1-bracteati. Petala libera v. basi æqualiter coalita.

§ 15.

Hab. A very few species of Abyssinia and the Cape (*L. undulatus*, E. M., and *L. Acacieæ*, Zucc.).

VI. Flores sæpius subternatim cymosi v. umbellatim v. cymosim paniculati, axillares, raro solitarii v. geminati, pedicellati v. sessiles, singuli 1-bracteati. Petala discreta 5, 6, 4.

§ 16. (*Euloranthus* § *Stylosi*, DC.)

The flowers are usually 5-merous; in the New Zealand species

4-merous. In one species, *L. bracteatus*, F. M., the flowers are enclosed in a pair of opposite foliaceous bracts.

Hab. Australia, New Zealand, Polynesia.

VII. Flores racemosi v. spicati, raro in nodos fasciculati, 1-bracteolati vel in foveam rhacheos leviter inserti, bractea plus minus obsoleta. Petala libera. (*Loranthus*, Mart. Reg. Flora, 1830, 102; Blume, Fl. Jav. Loranth. 12, in part. *Euloranthus*, Endl. Gen. Pl. 801, in part. *Phœnicanthemum*, Blume, *op. cit.* 13. *Lanthorus* ?, Presl, Epim. Bot. 256.)

a. Flores dioici, spicati.

§ 17.

Loranthus europæus is the only species which I can refer here.

b. Flores hermaphroditi. (*Euloranthus* § *Breviflori*, DC.)

§ 18.

This group may be artificially divided either by the symmetry of the flowers, or the inflorescence, whether racemose or spicate. In *L. odoratus*, Wall., very near *L. europæus*, they are partially immersed in the rachis. The petals are often dilated at the base (*Euloranthus* § *Unguiculati*, DC.), but I am not able to base a section upon this character.

Hab. India and the Archipelago; and two new African species (tetramerous) from the Island of St. Thomas and E. Tropical Africa, which I describe.

Loranthus Mannii, sp. nov. Cortice glabro punctato, foliis oppositis suboppositisve lanceolatis vix acuminatis apice obtusiusculis eveniis glabris petiolatis, floribus tetrameris racemosis, pedicellis calycem æquantibus, bracteis minutis, racemis axillaribus.

Hab. St. Thomas, alt. 5000 feet. Coll. G. Mann.

The linear anthers are adnate, two-celled, and each cell multilocellate, as in several other African species.

Leaves 2–3 in. × $\frac{6}{10}$–1 in., petiole $\frac{2}{10}$–$\frac{4}{10}$ in. Flowers $\frac{5}{10}$–$\frac{6}{10}$ in., usually curved to one side before expansion.

L. Kirkii, sp. nov. Cortice glabro plus minus striato, foliis oppositis alternisve ovatis v. ellipticis aut obovato-ellipticis obtusis glabris petiolatis, floribus in racemis terminalibus elongatis ∞-floris, pedicellis patentibus, bractea parva laterali, petalis 4.

Hab. Rovuma Bay, W. Africa, lat. 10° S. Coll. Dr. Kirk.

Branches slightly verrucose below. The racemes always terminal. Leaves $\frac{3}{4}$–2 in. × $\frac{3}{4}$–$1\frac{1}{2}$ in. Racemes 4–6 in. Flowers $\frac{3}{10}$–$\frac{4}{10}$ in.

VIII. Flores 4-meri petalis discretis. Stylus contortus. Bacca viscida.

§ 19.

Another solitary New Zealand species, *L. micranthus*, Hk. f.

IX. ? Folia verticillata v. alterna. Flores umbellati singulatim 1-bracteati sæpius subternatim dispositi, vel racemosi ternatim sessiles, bracteis totidem fulti.

§ 20. (Umbellatæ.)

Hab. Philippines and Malayan Archipelago. In one species the flowers are subsessile from the nodes. (Includes Cuming's Nos. 1947, 1952, 1956, 1957, 1958, 1964.)

§ 21. (Racemosæ.)

Hab. Philippines. (Cuming's Nos. 1945, 1976, &c.)

X. ? Flores di-trichotome cymosi, singuli bracteati, bractea cupulata obliqua v. lobata, 2½–9 unc. longi. Petala inferne coalita.

§ 22.

A few South American species included in *Psittacanthus* by Martius and Blume. I have separated them because of their adnate anthers, limiting *Psittacanthus* to species in which they are versatile.

Hab. Ecuador, Columbia, and the Amazon Valley. (Includes *L. macranthus*, Hook. Icones Pl. 743–4.)

Lichtensteinia, Wendl. (Sect. 6 of Blume, Flor. Jav. Loranth. 14), I omit, having been founded upon an error.

3. VISCUM, *L.*

Flores dioici v. monoici. *Fl. masc.* Perianthium 4–3-fidum; antheræ cum lobis perianthii adnatæ poris plurimis dehiscentes. *Fl. fœm.* Perianthium 4–3-lobatum. Stylus 0 vel brevis stigmate obtuso.

A. *Aphylla.*

1. *Perianthii lobis persistentibus.* (Flores ♀ in glomerulis oppositis v. interdum verticillati.) Includes species of India, Indian Archipelago, Mauritius and Bourbon, Australia, Polynesia, New Zealand. (*V. moniliforme*, *V. phyllanthus*, Cunn., *V. distichum*, &c.)

2. *Perianthii lobis caducis.* (Flores ♀ singulatim ternatimve bibracteolati, bracteolis sæpe connatis basin fructus cingen-

tibus.) Includes Indian, South African, Mauritian, and a few Australian species.

B. *Foliosa.*

1. *Perianthii lobis caducis.* (Flores singulatim v. 2-, 3-, 4-, 5-natim bibracteolati, vel flore terminali bibracteolato lateralibus 1-bracteolatis, vel bracteolis obsoletis.) Species of Europe, S. Asia, Central and S. Africa, &c. No Australian species. Includes *V. orientale*, *V. album*, &c.

4. GINALLOA, *Korthals, Verh. Bat. Genootschap.* xvii.

Flores monoici. *Fl. masc.* Perianthium 3 (4)-fidum; antheræ subsessiles, liberæ, biloculares. *Fl. fœm.* Perianthium 3 (4)-lobatum lobis persistentibus.—Folia opposita, sæpius 3-nervia; flores spicati, spicis articulatis, in articulis fasciculati v. solitarii oppositi, bracteis coalitis cincti.

A few species from the Malay and Indian Archipelago and Ceylon?, including *G. Arnottiana*, Korth., and *Viscum spathulifolium* (?) of Mr. Thwaites.

5. NOTOTHIXOS, gen. nov.

Flores monoici. *Fl. masc.* Perianthium 4 (raro 5)-fidum; antheræ sessiles, liberæ, sutura transverse lobatæ, lobis parallelis obscure ∞-locellatis. *Fl. fœm.* Perianthium 4 (3)-lobatum, lobis persistentibus.—Folia opposita, 3–5-nervia; flores capitellati, terminales, capitulis 3–9-floris pedunculatis v. subsessilibus solitariis v. geminatim v. ternatim v. paniculatim dispositis; in spec. Zeylanica flores spicati sunt.

1. N. CORNIFOLIUS. Paniculis terminalibus, floribus in capitulis 5–9-floris patentim pedunculatis bibracteolatis digitatim dispositis, foliis obovato-lanceolatis v. obovatis v. lanceolatis obtusis deinde emarginatis retusisve glabris glabrescentibusve.

Viscum cornifolium et *V. xanthophyllum*, Cunn. MS.

Hab. Hunter River and Liverpool Plains, N.S.W., Sydney, *Dr. Hooker.* —β. *angustifolia.* Brisbane River, *Cunningham, Fraser.* Moreton Bay, Queensland, *Cunningham.*

2. N. SUBAUREUS. Floribus in capitulis terminalibus 5–9-floris pedunculatis bibracteolatis radiatim dispositis, pedunculis simplicibus geminatisve aut ternatim ramosis, foliis ellipticis ovalibus vel ovato-lanceolatis obtusis v. subacutis subtus pilis aureis stellatis pubescentibus.

Viscum subaureum, F. Mueller.

Hab. Moreton Bay and Brisbane River, *Mueller.* Lake Macquarie, *Backhouse.*

Whole plant, especially the young parts, more or less clothed with golden

stellate pubescence, the upper side of the leaves at length glabrescent. Leaves shortly petiolate. Peduncles shorter than the branches from the fork of which they spring.

3. N. INCANUS.—*Viscum incanum*, Hook. Ic. Plant. i. t. 73.
Hab. Brisbane River, Queensland, *Fraser*.

4. ? N. FLOCCOSUS.—*Viscum floccosum*, Thwaites, MS.

6. TUPEIA, *Ch. et Schlecht. Linnæa*, iii. 203.

Flores dioici. *Fl. masc.* Perianthium 4-partitum; stamina libera, filamentis elongatis, antheris ellipticis bilocularibus longitudinaliter dehiscentibus. *Fl. fœm.* Perianthium 4-lobatum, lobis caducis; stylus validus, sejungens stigmate capitato. Semen albumine copioso.

One New Zealand species (*T. antarctica*). Dr. Lauder Lindsay sends a narrow-leaved form from Otago.

7. ARCEUTHOBIUM, *Bieb. Fl. Taur. Cauc. Suppl.* 629.

Flores dioici. *Fl. masc.* Perianthium 3-, 4- v. 5-partitum; antheræ sessiles, uniloculares, rimula transversa dehiscentes. *Fl. fœm.* Perianthium bidentatum; stigma sessile.—Species aphyllæ.

Includes *A. oxycedri* from Southern Europe, Western Asia, California, the Rocky Mountains, and Mexico. A plant of Seemann's from N.W. Mexico (2138) seems to be the ♂ of a distinct species. Fendler, New Mexico, 283, may be another species; but more material is needed for the determination of these.

8. PHORADENDRON, *Nuttall, Journ. Ac. Phil.* i. 185.

Flores dioici vel monoici. *Fl. masc.* Perianthium 3-fidum; antheræ lobis imis adnatæ, transverse biloculares, poris s. rimulis verticalibus duabus dehiscentes, v. interdum rimulis confluentibus uniloculares. *Fl. fœm.* Perianthium 3-lobum (rarius 2–4-lobum), lobis persistentibus; stigma sessile, obtusum.—Frutices sæpius foliosi, paucis aphyllis. Flores sessiles, spicati, rhachi plus minus immersi, spicis interdum abbreviatis.—*Spiciviscum*, Engel. Pl. Fendl. 58, et Karst., "nec Engelm." Fl. Columb. 73, t. 36; *Allobium*, Miers, A. N. H. ser. 2. viii. 178.

All American, so far as I have had opportunity of ascertaining, extending from the United States (*Ph. flavescens*) and California, through Texas, Mexico, West Indies, to Peru and Brazil. Engel-mann (Gray, Pl. Fendlerianæ, p. 58 in note) describes the perianth, both ♂ and ♀, as rarely 2- or 4-lobate. So does Dr. Gray (Bot. Northern States, ed. 2. 382). I have seen it so sometimes in *Ph. flavescens*; but in the other species which I have examined I have found only a 3-lobate perianth.

9. ANTIDAPHNE, *Poeppig, Nov. Gen.* ii. 70, t. 199.

(CHAR. EMEND.) Flores monoici v. dioici. *Fl. masc.* Perianthium 0 aut subnullum in segmenta setiformia reductum; stamina 3 v. 4, filamentis distinctis, antheris ovatis v. oblongis bilocularibus longitudinaliter dehiscentibus. *Fl. fœm.* Perianthium sæpius 3-lobatum, segmentis remotiusculis parvis, vel (fide Poepp.) margine undulato; ovarium limbo paullo longius; stylus brevissimus, stigmate capitato.—Folia alterna, 3-∞-nervia, crassiuscula, integra. Flores ♂ strobiliformiter spicati, singulatim v. 2–3-natim bracteati, bracteis squamiformibus caducis sessilibus v. basi angustatis. Stamina sæpe inæqualia; discus crassus, lobatus. Flores ♀ sessiles, sæpius ternatim bracteati, bracteis caducis.

Of the Peruvian species I have seen only a rather imperfect specimen, collected at Casapi by Matthews; but I have no hesitation in identifying the Venezuelan plant No. 1125 of Fendler, and Seemann's No. 1619 from Veraguas, with Poeppig's genus. They are probably distinct species, but we have only male or female flowers from either locality.

10. EUBRACHION, *Hook. fil. Fl. Antarct.* ii. 291 *adnot.*

Flores monoici, in spicis androgynis brevibus lateralibus. *Fl. masc.* Perianthium 3-partitum; stamina filamentis brevissimis, antheris bilocularibus didymis longitudinaliter dehiscentibus. *Fl. fœm.* Perianthium 3-lobum; stylus brevissimus, stigmate obtuso.

Flowers, both ♂ and ♀, sessile in the axil of small, rotundate, much-thickened scales. The specimens which I have seen are so imperfect, that it is not easy to construct a more contrasting diagnosis. But one species is known—*E. Arnottii* (*Viscum ambiguum*, Hook. et Arn. Bot. Misc. iii. 356), collected by Tweedie in Uruguay.

11. LEPIDOCERAS, *Hook. fil. Fl. Antarct.* ii. 293 *adnot.*

Flores dioici. *Fl. masc.* Perianthium 4-partitum; antheræ biloculares, longitudinaliter dehiscentes. *Fl. fœm.* Perianthium

4-lobum, lobis caducis; stylus brevis, stigmate obtuso. Semen albumine parco v. subnullo.—Folia squamula sicca apicali instructa. Flores ♂ racemosi, pedicellati, bracteis squamæformibus caducis: ♀ primum in spicis strobiliformibus sessiles, deinde (fructu) solitarii in axillis foliorum.

The only species known to me are, as above explained, *L. Kingii* and *L. Dombeyi*, Hk. f., from Peru, Chili, and the island of Chiloe.

12. Eremolepis, *Griseb. Pfl. Phil. und Lechl.* 36.

Flores dioici (fide Grisebach, *l. c.*). *Fl. masc.* (in *E. punctulata*): Perianthium 5-partitum; stamina filamentis brevissimis, antheris bilocularibus longitudinaliter dehiscentibus. *Fl. fœm.* (in *E. verrucosa*): Perianthium 3-lobatum, lobis caducis; stylus brevissimus, stigmate obtuso. Semen embryone cylindrico, albumine copioso.—Folia alterna, squamulis apicalibus destituta. Flores ♂ sessiles, bracteati, in bracteolis 2 lateralibus alabastri inclusi. Perianthium lobis crassiusculis apice mucrone parvo inflecto instructis. Pistillum rudimentarium, minute 3-fidum. Flores ♀ in spicis paucifloris brevissimis quasi glomerulati, sessiles, bracteis parvis caducis.

E. verrucosa and *E. punctulata* are the only species known to me, unless Grisebach be right in referring to this genus the following (*vide supra*, p. 96).

13. Genus novum? (*Eremolepis Wrightii*, Griseb. Pl. Wright. 192.)

Flores monoici. *Fl. masc.* Perianthium 4-partitum; stamina filamentis brevissimis, antheris bilocularibus oblique lateraliter dehiscentibus. *Fl. fœm.* Perianthium 3–4-lobum, lobis persistentibus. Albumen copiosum.—Folia alterna. Flores in spicis brevissimis paucifloris axillaribus, bracteati, bracteis parvis triangularibus.

On the Spicula contained in the Wood of the *Welwitschia*, and the Crystals pertaining to them. By Colonel Philip Yorke, F.R.S. In a letter to Dr. J. D. Hooker, F.R.S., &c.

[Read February 5, 1863.]

Febr. 4, 1863.

Dear Doctor Hooker,—I send you a note of my observations on the spicula contained in the wood of the Welwitschia, and the crystals pertaining to them.

I found, as I believe you had already, that when the spicula were immersed in dilute hydrochloric acid, even though they remained in the liquid several hours, there was no action on the crystals.

Also that when the spicula were placed in a platinum spoon with hydrofluoric acid and heated, and when the same was done with a solution of caustic soda, there was no apparent action on the crystals.

On the other hand, when the spicula were boiled in nitric acid, the crystals disappeared.

I then found that when a few spicula were carefully burned by heating them on platinum foil over a small spirit-flame, a white ash remained of the form of the spicula; and when this ash, moistened with water, was examined by the microscope, it was found to be made up of a congeries of the crystals unaltered in form, and acting on polarized light.

When a drop of dilute hydrochloric acid was added, the crystals disappeared, and, I thought, with effervescence. I then made the following experiment.

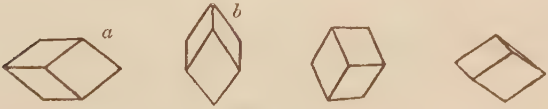
A quantity of the spicula was collected which weighed 0·105 gr.; this was carefully burned as before; the ash weighed 0·010 gr., or just 10 per cent.: water added to the ash, the liquid slightly restored the blue of reddened litmus; a drop of hydrochloric acid added, the ash dissolved with brisk effervescence; and when this, neutralized by ammonia, was tested by oxalate of ammonia, a considerable precipitate formed.

The supernatant liquid was removed, and tested by phosphate of soda; but a very minute, if any, precipitate was thus formed.

This experiment shows that the substance examined is essentially carbonate of lime, possibly with a little carbonate of magnesia.

The form of the crystals also supports this view, though their minuteness renders the examination difficult. By far the greater number of the crystals presented a rhombic outline, the largest measuring in their longer diagonal $\frac{1}{2000}$th of an inch. I obtained

Sketches of the crystals.



some approximation to the measure of the angles by means of a doubly refracting prism fitting on to the eye-piece of the microscope; the mean of several measures gave 106° nearly as the value of the obtuse angle (that of calc-spar being 105° 5′). With regard to the prismatic-looking crystals occasionally seen, I found several which, examined by favourable light, presented the figure *a*, *b*.

This form of rhomboid resembles that which was called by Haüy the "inverse," a peculiarity of which is, that its plane angles measure the same as the dihedral angles of the primary rhomboid.

The crystals of the so-called crystallized sandstone of Fontainebleau (which are carbonate of lime containing sand) are instances of this form.

As it appears from what I have stated that these crystals consist of carbonate of lime, the question remains, What is it that protects them from the action of acids?

I have made some attempts, but very imperfect, to throw some light on this question.

I found that alcohol and ether, even when heated, had not the power of removing the protecting substance.

But I found that if, after digesting with ether, the spicula were boiled in solution of caustic soda and subsequently immersed in dilute hydrochloric acid, the crystals disappeared, and their places were occupied by amorphous patches.

There is one objection that may perhaps be taken to the view I have adopted as to the nature of the crystals, which I may as well notice. It may be thought that in the plant the lime was united to some organic acid, say the oxalic. But I think it will be admitted that, putting aside the agreement in form with carbonate of lime, the fact of the crystals being unaltered in form by burning, and retaining the power of acting on polarized light, is fatal to such an hypothesis.

I remain,
Dear Doctor Hooker,
Very truly yours,
PH. YORKE.

Joseph D. Hooker, Esq., M.D., &c. &c.

On some new Species of *Amomum* from West Africa. By Professor OLIVER, F.L.S., and DANIEL HANBURY, Esq., F.L.S.

[Read April 16, 1863.]

WE have in preparation a monograph of the West African species of *Amomum*; but as there are yet some points to be cleared up, requiring further communication with residents at Sierra Leone and the ports of Liberia and of the Gulf of Guinea, we shall not be in a position to complete it during the present session of the Linnean Society. It appears, however, to be desirable that brief diagnoses of the new species should at once be laid before the Society, and we have accordingly prepared the following.

Specimens of all the plants described have been received, both in the dried state and preserved in fluid, accompanied in most cases by coloured sketches, from Mr. Gustav Mann, the able and persevering botanical collector to the Royal Gardens, Kew. In the Museum and Herbarium of this establishment the authentic specimens are deposited.

AMOMUM, *L.*

* *Scapi uniflori. Semina ellipsoidea, nitida.*

1. A. ARUNDINACEUM, sp. nov. Foliis lineari-lanceolatis, glabris, subsessilibus, scapis gracilibus 2–3 unc. longis, bracteis brevissime apiculatis, labello erecto rotundato-obovato, fructu late ovoideo nudo vel subnudo.

Hab. Corisco Bay, 1862, *G. Mann.*

** *Flores* 2–10 *congesti, in scapis simplicibus aut distiche ramosis.*

a. Labellum erectum, amplum, roseum v. purpureum. Folia glabra.

† *Scapi* 1–2-*pedalis, distiche ramosi.*

2. A. GIGANTEUM, sp. nov. Foliis amplis, elongatis, lanceolato-oblongis oblanceolatisve petiolatis, scapi ramulis sæpius bifloris, antheræ crista lobo centrali producto quadrato-oblongo bifido v. subintegro, fructu ovali-lanceolato, seminibus ellipsoideis nitidis.

Hab. Gaboon River, 1861, *G. Mann.*

†† *Scapi simplices, aut breves basi ramosi.*

3. A. SCEPTRUM, sp. nov. Foliis auguste oblongo-lanceolatis, petiolatis, ligula scariosa, scapis simplicibus apice clavato-turgidis circa 10-floris, bracteis superioribus dorso apicula tis, tempore florifero transverse plicatis, fructu ovoideo-compresso v. subtrigono glabro, pericarpio crasso, seminibus angulatis.

Hab. Gaboon River, 1861, *G. Mann.*

4. A. Mannii, sp. nov. Foliis oblanceolatis ellipticisve abrupte acuminatis, petiolatis, scapis 2–3 unc., 3–2-floris, bracteis brevissime apiculatis v. muticis, labello late obovato-rotundato.

Hab. Corisco Bay, 1862, *G. Mann.*

b. Labellum erectum, amplum, roseum v. purpureum. Foliis subtus minute pubescentia v. margine breviter pilosa. Staminodia libera.

5. A. subsericeum, sp. nov. Foliis lanceolatis acuminatis, brevi-petiolatis, subtus pubescentia venulis transverse intertexta subsericeis, scapis brevibus sæpius bifloris, fructu ovato-lanceolato v. ovoideo, seminibus ellipsoideis nitidis.

Hab. Gaboon River and Corisco Bay, 1862, *G. Mann.*

6. A. limbatum, sp. nov. Foliis oblongo-lanceolatis, acumine tenuiter caudatis, brevissime petiolatis v. sessilibus, subtus nervo medio atque margine brevissime ferrugineo pilosis, scapis brevibus 3-floris, fructu ovoideo, seminibus ellipsoideis nitidis.

Hab. Fernando Po, 1859 and 1861, *G. Mann.*

c. Flores parvi, lutei. Folia pilosa. Staminodia coadunata.

7. A. pilosum, sp. nov. Foliis elongato-lanceolatis acuminatis, breviter petiolatis, sparse pilosis, scapis brevibus bifloris, labello limbo transverse elliptico subcordato v. fere integro, fructu parvo obovoideo in tubo persistente perianthii repente contracto, seminibus perparvis transverse rugulosis.

Hab. Fernando Po, 1862, *G. Mann.*

*** *Scapi breves, obconici, capitati,* 10–15-*flori. Folia glabra.*

8. A. citratum, *Pereira, Pharm. Journ. and Trans.* ix. 313 *. Foliis elongatis, oblongo- v. obovato-lanceolatis, breviter acuminatis, petiolatis, scapis crassis, bracteis superioribus margine crispatis, labello amplo erecto, fructu obovoideo limbo lato perianthii persistente continuo coronato, seminibus obscure angulatis tuberculatisque, apice breviter conico productis.

Hab. Gaboon River.

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* As no description of this species has yet been published, we include its diagnosis in the present paper.

Note on the Embryo of *Ancistrocladus*. By G. Bentham, P.L.S., and J. D. Hooker, F.L.S.

[Read May 7, 1863.]

In the 'Genera Plantarum,' Part I. p. 191, we have fallen into an error in our description of the seed of *Ancistrocladus*, which error, as it affects the accuracy of the observations and drawings of so careful and excellent a botanist as Mr. Thwaites, which are published in our 'Transactions' (vol. xxi. p. 225. t. 24), we are desirous of correcting also in the Society's publications.

In the above-mentioned paper Mr. Thwaites describes the seed, from living specimens, as "Semen cerebriforme, erectum; testa plicato-intricata, albumen carnosum plicis involventi. Embryo orthotropus, clavatus; cotyledones subfoliacei, divergentes; radicula prope hilum posita."

When drawing up the generic character of *Ancistrocladus* for our work, we examined several seeds, and found their appearance to be not only as described by Mr. Thwaites, but so closely to resemble those of *Doona* and other *Dipterocarpeæ* (to which order we referred *Ancistrocladus* on other grounds), that we were led to suspect the accuracy of Mr. Thwaites's observation. Proceeding then to macerate the seeds, we found that in no case were we able to free the radicle from the supposed cotyledons, but that these appeared to be organically connected, whence we were led to describe what Mr. Thwaites called a ruminated albumen as contortuplicate cotyledons.

Mr. Thwaites, on receiving the 'Genera Plantarum' and observing our error, had the kindness to send to us ripe seeds of *Ancistrocladus* preserved in spirits, which clearly proved us to be in fault.

We may observe that this does not affect our view of the affinity of the genus being with *Dipterocarpeæ*, but adds one more to the already great proportion of exalbuminous Natural Orders in which albuminous genera occur.

Kew, May 5, 1863.

On the Identification of the *Acanthaceæ* of the Linnean Herbarium, in the possession of the Linnean Society of London. By T. Anderson, M.D., F.L.S., Officiating Superintendent of the Botanic Garden, Calcutta.

[Read April 2, 1863.]

Before leaving England for India in the beginning of 1861, I was able to devote some time to the examination of the *Acanthaceæ* existing in Linnæus's Herbarium, now the property of the Linnean Society. As the *Acanthaceæ* are eminently tropical, comparatively few species of the order were known to botanists of the time of Linnæus. Consequently the limits of the genera of the order were very indefinite—so much so, that many of the old genera are coextensive with the tribes or subtribes I have adopted in the rearrangement of the order. Indeed, the old genus *Ruellia* is equivalent to my Suborder *Ruellideæ*. Only five genera of *Acanthaceæ* are described in the 4th edition of the 'Genera Plantarum,' published in 1752, and, with the exception of *Thunbergia*, a genus of later date than 1752, these are the only genera recognized in Linnæus's Herbarium. The number of species is 67, distributed among the genera as follows:—*Thunbergia* 1, *Ruellia* 18, *Barleria* 9, *Acanthus* 11, *Justicia* 26, *Dianthera* 2.

There are, among these 67 species, representatives of 28 genera, according to the views I entertain of the limits of genera in this order; and many more, as will appear from the synonymy, if Nees von Esenbeck's opinions are adopted as he has stated them in the 11th volume of the 'Prodromus.'

The following list includes all the species referred to genera of *Acanthaceæ* by Linnæus, and specimens of which exist in his Herbarium. In preparing it for comparison, I have taken the names appended to the specimens by Linnæus as the basis of the arrangement, but in the sequence of the genera I have adopted my own arrangement. In the case of the Linnean names, I have quoted the work in which the species was first described. The name I adopt is then given.

A considerable array of synonymy occurs with some of the species; this is rendered necessary by my having quoted all those species of Nees von Esenbeck which I consider identical.

THUNBERGIA, *Linn. fil.*

1. T. CAPENSIS, Thunb. Nov. Plant. Gen. p. 21. *T. Capensis*, N. ab E. in DC. Prodr. xi. p. 55, et mihi.—This plant bears the name of *Solandra Capensis* in Linnæus's Herbarium.

RUELLIA, *Linn.*

1. R. BLECHUM, Linn. in Amœn. Acad. v. p. 400. *Blechum Brownei*, Juss. Ann. du Mus. ix. p. 270; N. ab E. l. c. p. 466, et mihi.—I refer Nees von Esenbeck's *B. Trinitense* and *B. Haenkei* to this species.

There is a second specimen in the Linnean Herbarium which is also called *R. Blechum*; it is probably an *Aphelandra*, but the species is not determinable.

2. R. CLANDESTINA, Linn. Sp. Pl. ed. 1753, ii. p. 634. *R. clandestina*, mihi. *Cryphiacanthus Barbadensis*, N. ab E. l. c. p. 197.—Nees von Esenbeck, at p. 156 of the 11th volume of the 'Prodromus,' gives *Cryphiacanthus clandestinus* as the name he adopts for Linnæus's *R. clandestina*, but that specific term does not occur among his species of *Cryphiacanthus*.

3. R. PANICULATA, Linn. Sp. Pl. ed. 1753, ii. p. 635. *R. paniculata*, mihi. *Dipteracanthus paniculatus*, N. ab E. l. c. p. 142.

4. R. TUBEROSA, Linn. Sp. Pl. ed. 1753, ii. p. 635. *R. tuberosa*, mihi. *Cryphiacanthus Barbadensis*, N. ab E. l. c. p. 197.—As appears by the synonymy, Nees von Esenbeck unites *R. clandestina* and *R. tuberosa*, Linn. Linnæus's specimens are certainly very distinct.

5. R. TENTACULA, Linn. in Amœn. Acad. iv. p. 320. *Haplanthus tentaculus*, N. ab E. l. c. p. 513, et mihi.

6. R. BIFLORA, Linn. Sp. Pl. ed. 1753, ii. p. 635, is an American species of *Calophanes*, but the specimen is too imperfect for identification. Nees von Esenbeck refers this to his *Calophanes oblongifolius*, DC. Prod. xi. p. 107.

7. R. CRISPA, Linn. Sp. Pl. ed. 1764, ii. p. 886. *Hemiagraphis crispa*, mihi.—*R. crispa*, N. ab E., is quite distinct from Linnæus's species, though Nees considers them identical. I have seen Nees von Esenbeck's species in Wight's Herbarium; it belongs to the small blue-flowered section of my remodelled genus *Hemiagraphis*. That section is very distinct from the yellow-flowered Strobilanthoid division of the genus, which contains species that are nearly all Eastern Asiatic or Malayan in their distribution, and may require to be separated generically from the blue-flowered Indian species.

8. R. REPANDA, Linn. Sp. Pl. ed. 1764, ii. p. 886. *R. repanda*, N. ab E. l. c. p. 144, et mihi.

9. R. RINGENS, Linn. Sp. Pl. ed. 1753, ii. p. 635. *Hygrophila salicifolia*, N. ab E. l. c. p. 92, et mihi.—This identification confirms Robert Brown's remark in the 'Prodromus Floræ Novæ Hollandiæ,' p. 479, under *Hygrophila angustifolia*. He says, "hujus congener et valde affinis est *Ruellia ringens*, Osb. et Linn. Sp. Pl. exclus. syn. Floræ Zeylanicæ et Rheed. Mal." The plant referred to by Linnæus in these works is probably *Ruellia prostrata*, Poir. Rheede's figure is not x. t. 64, as cited by Linnæus in the 'Flora Zeylanica' and the 'Species Plantarum,' but ix. t. 64.

10. R. ANTIPODA, Linn. Sp. Pl. ed. 1753, ii. p. 635, is *Bonnaya veronicæfolia*, Spreng.

11. R. REPENS, Linn. Mant. p. 89. *R. repens,* mihi. *Dipteracanthus lanceolatus,* N. ab E. l. c. p. 124.

12. R. LITTORALIS, Linn. Suppl. p. 289. *Calophanes littoralis,* T. Anders. in Thw. En. Pl. Zeyl. p. 225. *Dyschoriste littoralis,* N. ab E. l. c. p. 106.

13. R. DIFFORMIS, Linn. fil. Suppl. p. 299. *Adenosma triflora,* N. ab E. l. c. p. 68, et mihi.—Blume in the 'Bijdragen,' p. 804, refers this to his *Hygrophila difformis.* I have not seen Blume's plant, but it is probably a form of *Hygrophila salicifolia.*

14. R. BALSAMICA, Linn. Suppl. p. 289. *Adenosma balsamea,* Spr. Syst. ii. p. 829, et T. Anders. in Thw. En. Pl. Zeyl. p. 224.—The specific name is written "*balsamica*" in Linnæus's Herbarium.

15. R. ULIGINOSA, Linn. Suppl. p. 290. *Adenosma uliginosa,* N. ab E. in Wall. Pl. As. Rar. iii. p. 79, et DC. Prodr. xi. p. 69, et T. Anders. in Thw. En. Pl. Zeyl. p. 224.—Robert Brown in the 'Prodromus Fl. Nov. Holl.' can hardly be quoted as the authority for the species of *Adenosma,* as all the species indicated by him as belonging to it have been removed to *Scrophularineæ.*

16. R. PILOSA, Linn. Suppl. p. 290. *R. pilosa,* T. Anders. in Enum. Acanth. Afric. in Journ. Proc. Linn. Soc. vii. p. 25. *Fabria pilosa,* N. ab E. l. c. p. 114.—The species, however, in the Linnean Herbarium is by some error represented by what is evidently a species of *Antirrhinum.*

17. R. ALTERNATA, Burm. Fl. Ind. p. 135. *Hemiagraphis alternata,* mihi. *R. Blumeana,* et forsan *R. discolor,* N. ab E. l. c. p. 149.

18. *R.* species is *Stenandrium Pohlii,* N. ab E. l. c. p. 283, et mihi.

Two specimens included in the generic envelope of *Ruellia* in the Linnean Herbarium do not belong to the order Acanthaceæ; one is a species of *Phlox,* and the other is not determinable. A specimen marked "*Ruellia sp.* Linn. fil." is a species of *Phlox*; besides, there is a specimen of a *Ruellia* from North America in too imperfect a condition for identification.

BARLERIA, *Linn.*

1. B. LONGIFOLIA, Linn. in Amœn. Acad. iv. p. 320. *Hygrophila spinosa,* T. Anders. in Thw. En. Pl. Zeyl. p. 225. *Asteracantha longifolia,* N. ab E. l. c. p. 247.

2. B. HYSTRIX, Linn. Mant. p. 89. *B. Prionitis,* Linn. Sp. Pl. ed. 1753, p. 636, et T. Anders. in Thw. En. Pl. Zeyl. p. 230. *B. Hystrix,* N. ab E. l. c. p. 239.

3. B. PRIONITIS, Linn. Sp. Pl. ed. 1753, p. 636. *B. Prionitis,* N. ab E. l. c. p. 237, et T. Anders. l. c.

4. B. BUXIFOLIA, Linn. Sp. Pl. ed. 1753, p. 636. *B. buxifolia,* N. ab E. l. c. p. 241, et mihi.—The specimen is marked from Ceylon. I have seen no other specimens from Ceylon. See note appended to this species at page 231 of Thwaites's Enum. Plant. Zeylan.

5. B. NOCTIFLORA, Linn. Suppl. p. 290. *B. noctiflora,* N. ab E. l. c. p. 239, et mihi.

6. B. CRISTATA, Linn. Sp. Pl. ed. 1753, p. 636. *B. cristata,* N. ab E. l. c. p. 229, et T. Anders. in Thw. En. Pl. Zeyl. p. 230.—In Thwaites's Enumeratio Plant. Zeyl. I have placed *B. dichotoma* and *B. ciliata* of Roxburgh, as well as *B. Nepalensis* of Nees von Esenbeck, as synonyms of this species.

7. B. INDICA.—This seems to be an unpublished name; the specimen bearing it is *B. cristata.*

8. B. PUNGENS, Linn. Suppl. p. 290. *B. pungens,* N. ab E. l. c. p. 236, et mihi.

9. B. SERICEA.—*B. longiflora* is written in pencil on the sheet, and that is also the name under which the species was first published in the Supplement, p. 290. *B. longiflora,* N. ab E. l. c. p. 235, et mihi.

ACANTHUS, *Linn.*

1. A. MOLLIS, Linn. Sp. Pl. ed. 1753, p. 639. *A. mollis,* N. ab E. l. c. p. 270, et mihi.

2. A. CARDUIFOLIUS, Linn. Suppl. p. 294. *Blepharis carduifolia,* T. Anders. in Enum. Acanth. Afric. in Journ. Proc. Linn. Soc. vii. p. 35. *Acanthodium carduifolium,* N. ab E. l. c. p. 278.

3. A. SPINOSUS, Linn. Sp. Pl. ed. 1753, p. 639. *A. spinosus,* N. ab E. l. c. p. 271, et mihi.

4. A. ILICIFOLIUS, Linn. Sp. Pl. ed. 1753, p. 639. *A. ilicifolius,* T. Anders. in Thw. En. Pl. Zeyl. p. 232. *Dilivaria ilicifolia,* (Juss.) N. ab E. l. c. p. 268.

5. A. MADERASPATANUS, Linn. MSS. in Herb. *Blepharis molluginifolia,* (Juss.) N. ab E. l. c. p. 266, et T. Anders. in Thw. En. Pl. Zeyl. p. 231.—I am obliged to cite the Linnean specimen of this species in the manner I have done, because the name, though evidently suppressed on the sheet and transferred to Jussieu's *B. Boerhaaviæfolia,* has had no other substituted for it by Linnæus.

6. A. FURCATUS, Linn. Suppl. p. 295. *Blepharis furcata,* T. Anders. in Enum. Acanth. Afric. in Journ. Proc. Linn. Soc. vii. p. 35. *Acanthodium furcatum* et *A. macrum,* N. ab E. l. c. p. 276.

7. A. Capensis, Linn. Suppl. p. 295. *Blepharis Capensis*, Pers. Syn. ii. p. 180, et mihi. *Acanthodium Capense*, N. ab E. l. c. p. 276.

8. A. Maderaspatensis, Linn. Sp. Pl. ed. 1753, p. 639. *Blepharis Boerhaaviæfolia*, Juss., N. ab E. l. c. p. 266, et T. Anders. in Thw. En. Pl. Zeyl. p. 231.

9. A. Maderaspatensis (?) is *Blepharis edulis*, Pers. Syn. ii. p. 180, et mihi. *Acanthodium spicatum*, (Delile) N. ab E. l. c. p. 274.

10. A specimen marked "A. 1." is *Hygrophila spinosa*, T. Anders. in Thw. En. Pl. Zeyl. p. 225. *Asteracantha longifolia*, N. ab E. l. c. p. 247.

11. "*Acanthus* ex Cap. Bon. Spei" is *Sclerochiton Harveyanus*, N. ab E. l. c. p. 279, et mihi.

Justicia, *Linn.*

1. J. Adhatoda, Linn. Sp. Pl. ed. 1753, p. 15. *J. Adhatoda*, (Linn.) T. Anders. in Thw. En. Pl. Zeyl. p. 233. *Adhatoda Vasica*, N. ab E. l. c. p. 387.

2. J. Ecbolium, Linn. Sp. Pl. ed. 1753, p. 15. *Eranthemum Ecbolium*, T. Anders. in Thw. En. Pl. Zeyl. p. 235. *J. Ecbolium*, N. ab E. l. c. p. 426. *J. gymnostachya*, N. ab E. l. c. *J. lætevirens*, (Vahl) N. ab E. l. c. p. 427. *J. strobilifera*, (Lam.) N. ab E. l. c. *J. emarginata*, N. ab E. l. c. *J. rotundifolia*, N. ab E. l. c. *J. syringifolia*, (Vahl) N. ab E. l. c. *J. livida*, (Wall.) N. ab E. l. c. *J. dentata*, (Klein) N. ab E. l. c. —Linnæus's specimen of this species is a cultivated one from the Upsal Botanic Garden.

3. J. Ecbolium, Linn. (No. 2.)—This is probably *Aphelandra tetragona*, N. ab E. l. c. p. 295, but the specimen is too imperfect for specific identification.

4. J. pulcherrima, Linn. Suppl. p. 84. *Aphelandra pulcherrima*, (H. B. K.) N. ab E. l. c. p. 295, et mihi.

5. J. picta, Linn. Sp. Pl. ed. 1762, p. 21. *Graptophyllum hortense*, N. ab E. l. c. p. 328, et mihi.

6. J. infundibuliformis, Linn. Sp. Pl. ed. 1762, p. 21. *Crossandra infundibuliformis*, N. ab E. l. c. p. 280, et mihi.—*C. axillaris* et *C. oppositifolia*, N. ab E., cannot be considered good species; I therefore include them under *C. infundibuliformis*.

7. J. fastuosa, Linn. Mant. p. 172. *Hypoestes fastuosa*, (Soland.) N. ab E. l. c. p. 507, et mihi.

8. J. Gendarussa, Linn. Suppl. p. 85. *J. Gendarussa*, T. Anders. in Thw. En. Pl. Zeyl. p. 233. *Gendarussa vulgaris*, N. ab E. l. c. p. 410.

9. J. TRANQUEBARIENSIS, Linn. Suppl. p. 85. *J. Tranquebariensis,* mihi. *Adhatoda Tranquebariensis,* N. ab E. l. c. p. 399.

10. J. HYSSOPIFOLIA, Linn. Sp. Pl. ed. 1753, p. 15. *J. hyssopifolia,* (Linn.) T. Anders. in Enum. Acanth. Afric. in Journ. Proc. Linn. Soc. vii. p. 41. *Adhatoda hyssopifolia,* N. ab E. l. c. p. 392.—Nees von Esenbeck has confused *J. hyssopifolia* and *J. cuneata,* Vahl (*Adhatoda,* N. ab E.), and has therefore cited some of the specimens of *J. cuneata,* a truly Cape of Good Hope species, under the name *J. hyssopifolia. J. hyssopifolia* has not been found on the continent of Africa.

11. J. ACAULIS, Linn. Suppl. p. 84. *Elytraria crenata,* (Vahl) N. ab E. l. c. p. 63, et mihi.—Palisot de Beauvais's West African species, *E. marginata,* and the North American *E. virgata,* N. ab E., with the synonymy quoted by Nees, both belong to this species, for which I retain Vahl's specific name.

12. J. CILIARIS, Linn. Suppl. p. 84. *Schwabea ciliaris,* N. ab E. l. c. p. 384, et T. Anders. in Enum. Acanth. Afric. in Journ. Proc. Linn. Soc. vii. p. 45.

13. J. PROCUMBENS, Linn. Fl. Zeyl. p. 7. *J.* (sect. *Rostellaria*) *procumbens,* (Linn.) mihi. *Rostellaria procumbens,* N. ab E. l. c. p. 371. *R. rotundifolia,* N. ab E. l. c. p. 370. *R. Abyssinica,* (Brongn.) N. ab E. l. c. p. 372. *R. mollissima,* N. ab E. l. c. p. 373. *R. Royeniana,* N. ab E. l. c. *R. crinita,* N. ab E. l. c.

14. J. DIFFUSA, Sm. MSS.—This specific name is not in Linnæus's handwriting, but in that of Sir James Smith. The species is *Lepidagathis hyalina,* N. ab E. l. c. p. 252.

15. J. PECTINATA, Linn. Amœn. Acad. iv. p. 299. *Rungia pectinata,* N. ab E. l. c. p. 470, et mihi. *R. parviflora,* N. ab E. l. c. et T. Anders. in Thw. En. Pl. Zeyl. p. 234. *R. polygonoides,* N. ab E. l. c. p. 471. *R. origanoides,* N. ab E. l. c. *R. muralis,* Royle, N. ab E. l. c. p. 470.

16. J. REPENS, Linn. Sp. Pl. ed. 1753, p. 15. *Rungia repens,* N. ab E. l. c. p. 473, et T. Anders. in Thw. En. Pl. Zeyl. p. 235.

17. J. CHINENSIS, Linn. Sp. Pl. ed. 1753, p. 16. *Dicliptera Chinensis,* N. ab E. l. c. p. 477, et mihi. *D. Burmanni,* N. ab E. l. c. p. 83. *D. Roxburghiana,* N. ab E. l. c.

18. J. ECHIOIDES, Linn. Sp. Pl. ed. 1753, p. 16. *Andrographis echioides,* N. ab E. l. c. p. 518, et T. Anders. in Thw. En. Pl. Zeyl. p. 232.

19. J. SEXANGULARIS, Linn. Sp. Pl. ed. 1753, p. 16. *Dicliptera sexangularis,* (Juss.) N. ab E. l. c. p. 479, et mihi.

20. J. ASSURGENS, Linn. Amœn. Acad. v. p. 391. *Dicliptera assurgens,* (Juss.) N. ab E. l. c. p. 489.

21. J. NASUTA, Linn. Sp. Pl. ed. 1753, p. 16. *Rhinacanthus communis*, N. ab E. l. c. p. 442, et T. Anders. in Thw. En. Pl. Zeyl. *R. Rottlerianus*, N. ab E. l. c. p. 443.

22. J. BIVALVIS, Linn. Sp. Pl. ed. 1762, p. 23. *Dicliptera bivalvis*, (Juss.) N. ab E. l. c. p. 475, et T. Anders. in Thw. En. Pl. Zeyl. p. 235.

23. J. PURPUREA, Linn. Sp. Pl. ed. 1753, p. 16. *Hypoestes purpurea*, (R. Br.) N. ab E. l. c. p. 509, et mihi.—This species has not been found in India. Griffith's specimen in the Hookerian Herbarium, quoted by Nees von Esenbeck in the 'Prodromus' as from Assam, is a cultivated specimen from the Calcutta Botanic Garden, into which the plant was introduced from China by Mr. Reeves in 1820. The specimen in the Linnean Herbarium is also from China.

24. J. GANGETICA, Linn. Amœn. Acad. iv. p. 299. *Asystasia Gangetica*, T. Anders. in Thw. En. Pl. Zeyl. p. 235. *A. Coromandeliana*, N. ab E. l. c. p. 165. *A. plumbaginea*, N. ab E. l. c. p. 164. *A. quaterna*, N. ab E. l. c. p. 166. *A. intrusa*, N. ab E. l. c. *A. Bojeriana*, N. ab E. l. c. *A. Comorensis*, (Bojer) N. ab E. l. c. *A. calycina*, Benth. Fl. Nig. p. 478, non N. ab E.—I appended the following note to this species in Thwaites's Enumeratio Plantarum Zeylaniæ, p. 236:—"The extensive distribution of this species over tropical Asia and Africa renders the specific name adopted by Nees von Esenbeck quite inappropriate, and the same objection may be made to the original one given by Linnæus, and which, as being the oldest, I have revived. For so cosmopolitan a plant the specific term *communis* or *vulgaris* would perhaps be more suitable."

25. J. BICALYCULATA, Vahl. This specimen has not a Linnean specific name attached. In the Supplement, p. 85, it is described under the name *Dianthera Malabarica*.

26. A specimen named *J. hyssopifolia*, and on another portion of the sheet having *J. antidota*, written by Sir J. Smith, is *J. Betonica* var. *Neilgherriensis*, mihi; *Adhatoda Nilgherrica*, N. ab E. l. c. p. 386. The *J. hyssopifolia* of the 1st edition of the 'Species Plantarum' is a native of the Canary Islands.

DIANTHERA, *Linn.*

1. D. AMERICANA, Linn. Sp. Pl. ed. 1753, p. 27, is a species of *Rhyttiglossa*, probably the *R. pedunculosa*, N. ab E. l. c. p. 339.

2. D. COMATA, Linn. Sp. Pl. ed. 1762, p. 24. *Leptostachya comata*, N. ab E. l. c. p. 381.

The specimen marked *Eranthemum hyssopifolium* does not belong to the order Acanthaceæ.

On *Anisostichium*, a proposed new Genus of *Musci*.

By William Mitten, A.L.S.

[Read June 18, 1863.]

Anisostichium, gen. nov.

Foliis inæqualibus, diversiformibus, uno latere majoribus distichis, altero minoribus stipuliformibus; florescentia terminali fructuque *Weberæ*.

1. A. Tozeri. Foliis tristichis, majoribus patulis verticaliter subplanis, minoribus suberectis lanceolatis ovato-lanceolatisve.

Bryum Tozeri, Greville, Scot. Crypt. Fl. v. t. 285.

Hab. In Britannia Galliaque australi, India orientali temperata, et in insulis Sardiniæ, Madeiræ, et Javæ.

Fig. 3. A sterile stem, magnified.

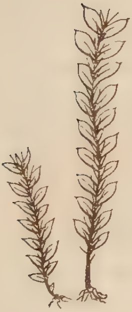


Fig. 1 (A. pictum).

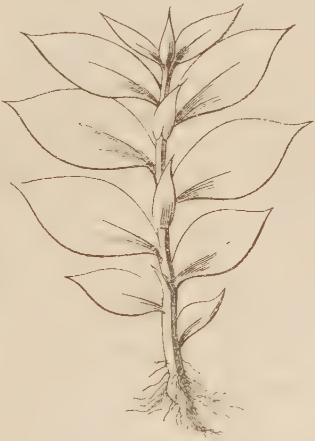


Fig. 3 (A. Tozeri).

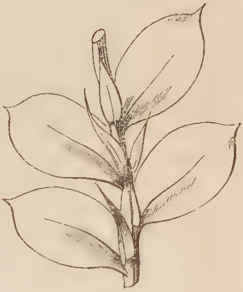


Fig. 2 (A. pictum).

2. A. pictum, sp. nov. Caulibus elongatis, foliis majoribus patentibus verticaliter complanatis late obovatis apice apiculatis submarginatis integerrimis nervo infra apicem evanido, minoribus tristichis erectis ovato-lanceolatis nervo breviore cellulis laxis elongatis pellucidis.

Hab. In Jamaica (*Hb. Hooker.*), Veraguas (*Dr. Seemann*), et in America fœderata australiore.

Fig. 1. Stems, of the natural size. Fig. 2. A portion magnified.

Leaves pale green, the older ones as well as the stems becoming beautifully tinged with red. Rudiments of inflorescence are alone observable on the specimens from Jamaica, and these occur on stems having the same arrangement of leaves as in those which are barren. In *A. Tozeri* the leaves of the fertile stems show but indistinctly the tristichous arrangement sufficiently evident in the sterile.

This genus occupies a place in the group of Mosses which correspond in areolation and fructification with *Bryum*, and constitute the tribe *Bryaceæ*; it is closely allied to *Webera*, with which its fruit agrees; but it differs from all other genera yet known to belong to that group in the same manner as *Calomnion* does from *Hymenodon* and other *Mniaceæ*. If the arrangement of the leaves alone was a sufficient character to form a genus, *Anisostichium Tozeri* would exactly correspond with *Calomnion*; but the areolation of the latter is composed of rounded hexagonal cells, and is precisely that of *Rhizogonium*, which so closely simulates the forms of *Mnium*, that they must all be referred to the same natural group—*Mniaceæ*. The analogy of form is carried still further in *Mniopsis*, which has barren and fertile stems with their leaves disposed as in corresponding stems of *Schistostega*; but the areolation is distinctly Mnioid, whilst *Schistostega* has the areolation observable in *Anisostichium* and *Webera*, and thus is more nearly allied to them, and belongs to the *Bryaceæ*,—there being no connecting link between it and the *Splachnaceæ*, to which Schimper, although instituting for its reception his family *Schistostegeæ*, is inclined to refer it.

On the Ink-plant of New Granada (*Coriaria thymifolia*). By Dr. WILLIAM JAMESON, of Quito; in a Letter to I. A. HENRY, Esq. (Communicated by J. D. HOOKER, M.D., F.R. & L.S.)

[Read June 18, 1863.]

"Quito, April 11, 1863.

"I AM anxious to have Dr. Hooker's opinion of the 'Ink-plant.' There is a tradition here respecting this vegetable juice that merits attention. It happened, during the Spanish Administration, that a number of written documents, destined to the mother country, were embarked in a vessel, and transmitted round the Cape. The voyage was unusually tempestuous, and the documents got wetted with salt water. Those written with common ink became nearly illegible, whereas those written with 'Chauchi' (the name of the juice) remained unaltered. A decree was thereupon issued that the Government communications should in future be written with the vegetable juice....I do not vouch for the correctness of this statement, but I have constantly heard it repeated from different sources. I generally use this ink in preference to the commercial article, as it is not so apt to corrode the steel pen. The present note is written with it, and has no admixture whatever, being only yesterday expressed from the fruit. When newly written, its colour is reddish, becoming black after a few hours."

A Description of some remarkable Malformations affecting the Genus *Lolium*. By Maxwell T. Masters, M.D., F.L.S., Lecturer on Botany, St. George's Hospital.

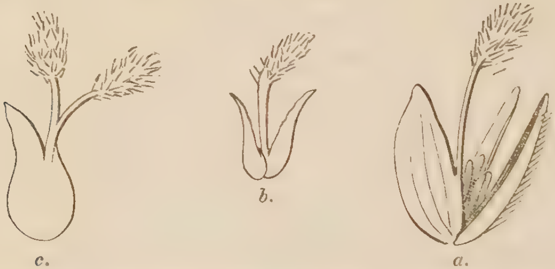
[Read March 19, 1863.]

In the volume of the Bull. Soc. Bot. Fr. for the year 1858, p. 85, M. Fournier has described four varieties of *Lolium perenne* as of common occurrence, and in a paper in Seemann's Journal of Botany, vol. i. p. 6, I have mentioned certain others. The specimens I have now the honour of laying before the Society must be classed under the head of Deformities rather than that of Varieties.

The simplest of the changes now to be mentioned consists merely in the lengthening of the axis of the spikelet, in consequence of which, the constituent florets are separated by much longer intervals than usual. In some examples of this, the axis is not merely lengthened, but becomes very flexuose, while the outermost glume only just exceeds the lowermost floret in length, and is very short in proportion to the length of the spikelet; hence the aspect of the plant is very different from that of the natural form. This change may occur independently of any other; but I have most frequently met with it in the branched variety, common under the several names of *L. perenne compositum*, *paniculatum*, or *ramosum*. Usually only a few of the spikelets are so affected; but in the plant now shown all the spikelets are thus changed.

In another series of specimens I have met with the following changes:—The spikelets have assumed more of a rounded outline than usual, and are shorter than the outer glume. The number of florets is in general reduced to three, in each of which, or sometimes in the lower one only, considerable changes have taken place. The paleæ are for the most part unchanged; but in some of the spikelets the inner palea is placed opposite to the outer one, and on the same level with it, while in others the inner palea is split into two, thus rendering the symmetry of the whorl complete (fig. 1, *a*). Within the paleæ, in place of the stamens and pistils is a confused mass, consisting of numerous scales, the outermost of which resemble paleæ, and are frequently more or less recurved or hooklike at their points; the inner ones are smaller, and either merely white and membranous like the ordinary lodicles, or they exhibit various intermediate stages between the state of scales and that of feathery stigmata (fig. 1, *b*, *c*). I have not been enabled to discover, in any of the very numerous specimens examined, the slightest trace either of stamens or of ovules.

Fig. 1.



a. Floret showing outer palea partially stigmatic; inner palea partly divided into two, and enclosing a number of scales. *b*, *c*. Inner scales from florets, showing tendency to assume appearance of the pistil.

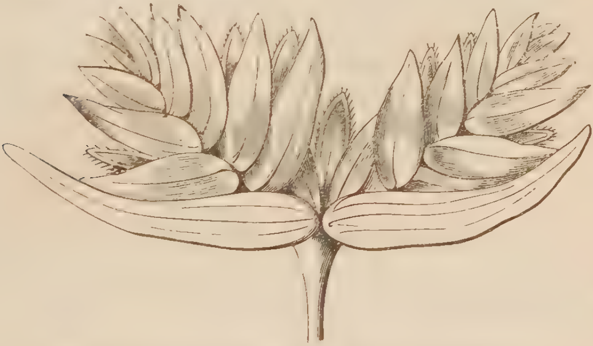
To sum up the peculiarities afforded by these specimens, it may be said that they present a diminished number of florets, an alteration in the form of the spikelet, a change in the number and disposition of the paleæ, a partial chloranthic condition of the inner constituents of the florets, a multiplication of these constituents, and a tendency in them to assume the nature of the pistil.

In a third series of specimens the changes that have taken place are yet more grave and singular. In the lower part of the spike the spikelets are of the ordinary form, and are arranged singly and alternately on the sides of the grooved rachis; but towards the upper part of the spike a change in the disposition takes place, and the spikelets become arranged in pairs on each notch of the rachis, as they are in *Elymus* or *Hordeum*, the pairs being arranged alternately as usual, but in four or more rows instead of in two.

The spikelets themselves are more or less spherical in form, each has an outer and inner glume of the ordinary aspect, and is made up of a number of florets arranged, not in two rows, but in several, and, owing to the shortening of the rachis of the spikelet, they are densely tufted. So closely are the florets crowded, that in many instances a fusion of the outer paleæ of two contiguous florets has taken place. This double palea shows eleven ribs, five on each half, and a central one in the line of fusion.

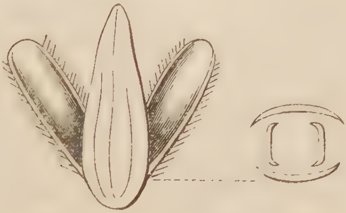
The union sometimes extends also to the inner paleæ; and in one case the inner pales of three florets were united together. Within the paleæ may here and there be found a perfect flower; but more usually there are a number of scales, the outer ones palea-like, often twisted spirally, and hooked at the summit; the succeeding ones exhibit various intermediate conditions between that of palea and that of stamens, while the central ones are merely rudimentary scales. The lodicles are not distinguishable from these latter; and, contrary to what happens in the second series of specimens now described, in the present instance there is no trace of pistil, except in the case immediately to be described. In addition to the changes just mentioned, the axis of the spikelet just within the outer glumes occasionally divides into two diverging branches, each bearing its tuft of florets (fig. 2). In the fork between the two branches is placed in some, but not in all, a single floret, which thus terminates the main axis of the spikelet, after the fashion followed in a dichotomous cyme. The component parts of this floret are arranged after a different method from the ordinary one (fig. 2 *a*). The outer whorl consists

Fig. 2.



Branching of axis of spikelet within the outer glumes.

Fig. 2 *a*.



Central, terminal floret, and plan of the same.

of two paleæ, placed directly opposite one another, and quite resembling in form and appearance the ordinary outer palea. Within these, and at right angles to them, are two more segments, precisely resembling the inner paleæ of the natural flower; within these, again, are a number of thin membranous scales, some of them having more or less of the appearance of the stigmata.

Thus in these very curious specimens the following changes, or some of them, may be observed:—

1st. An alteration in the form of the spikelets, whereby they become spheroidal.

2ndly. Their arrangement in pairs instead of singly on each notch of the rachis, and also in more than two vertical rows.

3rdly. The disposition of the florets in close tufts or whorls; in consequence of which, 4thly, the outer and inner paleæ become more or less fused together.

5thly. Multiplication of the inner portions of these florets, and their presence in the form of scales, exhibiting transitional stages between the scales and stamens.

6thly. Bifurcation of the axis of the spikelet; and, 7thly, the occasional presence of a floret of peculiar construction in the angle of divergence of the two branches.

Account of the Botanical Collections made by DAVID LYALL, M.D., R.N., F.L.S., Surgeon and Naturalist to the North American Boundary Commission.

[Read June 18, 1863.]

THE plants upon which the following observations were made, and of which a complete systematic catalogue is appended, were collected in the years 1858–1861, during which period I was, firstly, Surgeon of H.M. Surveying-ship 'Plumper,' and afterwards Surgeon and Naturalist to the Commission appointed to mark out the boundary-line between the British Possessions and those of the United States of America, to the westward of the Rocky Mountains.

The dried plants were transmitted from time to time, as collected and preserved, to Sir William Hooker, at the Royal Gardens at Kew. Of these, the earlier collections were provisionally arranged and catalogued soon after their arrival by Mr. Black, the Curator of the Herbarium; my later and more extensive collections, together with those that followed me to England, were retained intact until such time as I should receive authority from Her Majesty's Government to complete the arrangement of the whole and prepare the accompanying report upon the botanical results of the Boundary Commission.

The necessary arrangements having been made which enabled me to repair to Kew, I immediately commenced the sorting and ticketing of the specimens in all the collections, previous to throwing them together into one complete classified Herbarium and comparing them with the rich North American Herbarium of Sir William Hooker, which, from its containing the plants of every previous explorer of British North America, named in accordance with that celebrated botanist's 'Flora Boreali-Americana,' offered facilities for such a comparison that no other botanical establishment possesses.

The collections having been accurately and, indeed, authentically named, and a complete set laid into the Hookerian Herbarium, I distributed the duplicates to various public museums and botanists in Europe and North America, as well as India and Australia—those having been selected in which (according to the authorities at Kew) they would be most beneficial to science. In doing this, I attached to every specimen a ticket, bearing the same name, locality, &c., as that attached to the specimens retained in the Herbarium at Kew. This done, I drew up the report as follows.

The collections contained 1375 species, of which upwards of 6700 specimens were distributed, not including in the number of the latter the Algæ, Mosses, Hepaticæ, or Lichens. Of the latter order sixty sets are made up, ready for distribution. The others were made up into sets as far as the duplicates of each species would allow, and sent to the following Herbaria:—

Dr. Asa Gray, Cambridge University, Massachusetts.
Musée d'Histoire Naturelle, Paris.
Royal Herbarium, Berlin.
Herbarium, Botanical Gardens, St. Petersburg.
Imperial Herbarium, Vienna.
Professor N. J. Anderson, Stockholm.
Professor Grisebach, Göttingen.
Herbarium, Trinity College, Dublin.
M. Boissier, Geneva.
Royal Herbarium, Leyden.
Professor Bungé, Dorpat.
Dr. Lindley, F.R.S.
John Ball, Esq., F.R.S.
Royal Herbarium, Calcutta.
Royal Herbarium, Munich.
Professor Fries, Upsal.
Professor O. Heer, Zurich.
Dr. Mueller, F.R.S., Melbourne.

This appears to me to be the proper place in which to record the obligations which Sir William Hooker has conferred, in his public capacity, upon science, and, in a private one, upon myself, for whatever value the results of my labours may possess. The attachment of a botanist to the Boundary Commission was due to his powerful representations to Her Majesty's Government; and I owe my own appointment to that office to his friendship and the kind offices of Admiral Washington, the Hydrographer of the Admiralty.

During the whole progress of the expedition I was honoured and stimulated by Sir William's encouraging correspondence, and on my return he allowed me the free use of the noble Herbarium at Kew for the purposes above detailed.

During the time that I was employed at Kew, and indeed previous to that, as far as regards the classification of my earlier collections, I received the most cordial and essential aid from Mr. A. Black, A.L.S., Curator of the Herbarium, but for whose extensive knowledge of American botany and its literature, and intimate acquaintance with the plants in the Herbarium, I could not have named my collections with that accuracy which, thanks to his exertions, may now be confidently claimed for them.

To my old friend Professor Harvey, F.R.S., of Dublin, the distinguished Algologist, I am indebted for the examination and description of the Algæ, an account of which will be found in the 6th volume of the Linnean Society's Journal.

I have been fortunate in securing the services of Mr. William Mitten, A.L.S., in the arrangement and naming of my extensive collections of Mosses, Hepaticæ, and Lichens, which thus have the value of being named by one of the most able and assiduous Cryptogamists in England. Mr. Mitten further intends to draw up an account of them for publication.

A large collection of Fungi was formed, and preserved principally in saline solution. These, it was hoped, would have enabled some botanist in that obscure and difficult department to have thrown some light on the species of North-west America; but the Rev. M. J. Berkeley, F.L.S., to whom they were submitted, states that they have had their distinctive features so much altered as to render them unfit for description.

I should be ungrateful did I omit to mention here also how much indebted I am for the kind support which I received from Lieut.-Col. Hawkins, R.E., Her Majesty's Boundary Commissioner, throughout the expedition *, as well as from my old friend Captain G. H. Richards, R.N., of Her Majesty's Surveying-ship the 'Plumper,' during the few months that I had the pleasure of serving on board that vessel.

The summer of 1858 was spent partly on board the 'Plumper,' at the south-east corner of Vancouver Island and amongst the islands in the Gulf of Georgia, and partly with a detachment of men belonging to the Boundary Commission in the Fraser River Valley, west of the Cascade Mountains, and a little more than twenty miles from the sea.

The summer of 1859 was passed in the same localities as above mentioned, and on the western slope of the Cascade Mountains, close to the 49th parallel.

In May 1860 the Columbia River was entered, and in that season collections were made on both sides of the river, from the Dalles (where our party was divided into two) up to the 49th parallel, and from the summits of the Cascade Mountains as far east as Colville, where the winter-quarters of the expedition were located.

In 1861 parties were pushed forward to the eastward as far as the watershed of the Rocky Mountains (the extreme point to which the Boundary-line had to be run), whence an opportunity was afforded us of paying a hurried visit to the plains at the eastern base of the mountains, as well as of forming collections in their more elevated regions.

General character of the Regions traversed.

Immediately on the 49th parallel (with the exception of the bare Cascade Mountain tops) there is no interruption to the forest from the Gulf of Georgia to the Similkameen valley, on the east side of the Cascade Range. Here, trees not met with on the other side make their appearance, and the country becomes more open, grass in greater or less luxuriance being common under the trees, which in some places disappear almost entirely, as in a great part of the Similkameen valley and the country near Lake Osoyoos, on the hills as well as in the valleys. Indeed, on arriving at the watershed of the Cascade Mountains, a marked difference is observed in this respect. To the westward there is no grass nor food for animals to be found in the forest on the line of march from the Chilukweyuk prairie, near the Fraser River, to the summit of the mountains; on account of which, a great proportion of the loads carried by horses and mules travelling this way must necessarily consist of grain for themselves. The only exception to this dearth of fodder is that near the Chilukweyuk Lake, which is at an altitude of 2052 feet above the sea-level, are some wet and swampy green spots, of small extent and destitute of trees. These are called 'wet prairies,' and are covered chiefly with Gramineæ, Cyperaceæ, and Equisetaceæ, all of very luxuriant growth, and in sufficient quantity to feed a small number of animals, which greedily devour the latter especially, in spite of their siliceous coats. In winter, at times when the grass is deeply covered with snow, the Equisetaceæ, growing under the fringe of trees and bushes bordering the streams, form the principal food of such horses and mules as are unfortunate enough to have to trust entirely to nature for their supplies. As soon as the eastern slope of the Cascades is attained, all difficulty about fodder for animals ceases, and parties may travel from thence to the Rocky Mountains without grain for their beasts of burden. At the same time, with a large organized party like ours, where the mules were kept constantly on the move as long as the ground could be travelled over for snow, there is a short part of the route, between Sinyakwateen on the Pend Oreille River, and Chelemta on the Kootenay, where, on account of the comparative scarcity of grass, especially in autumn, it was considered advisable to pack a certain quantity of grain for the animals, in order to preserve them in full strength and vigour.

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* Sapper John Buttle, R.E. (who underwent a training at Kew before the expedition left England), was excused from his regular duties whenever required to assist me in collecting and preserving specimens, &c., and was found a useful assistant.

Eastward from the valley of the Similkameen the country is generally grassy, with hills of moderate elevation, for a distance of sixty or seventy miles. At the point where the Nẹhoialpitq River bends suddenly to the southward to join the Columbia, a mountainous region commences. Indeed, from this, all the way to the Rocky Mountains, along the 49th parallel, there is nothing but a succession of steep mountain-ranges, with some narrow valleys and ravines between, and the country altogether is so rugged, that any traveller proceeding from the Similkameen to the Boundary Pass in the Rocky Mountains must necessarily go as far south as the Spokan valley, in about lat. 47° 50′ N., to enable him to accomplish his object.

To return to the west side of the Cascade Mountains: the work there having been finished as far as Roche River, in the heart of the range, it was found necessary, in consequence of the difficulty and time that must have been expended in transporting such a large party across the Cascades, to ascend the Columbia River in order to get to the eastward of those mountains. This was done in steamers as far as the Dalles. Here the party divided, one portion proceeding up the west side of the river, in a northerly direction, by Fort Simcoe, across the Natchess and other tributaries of the Yakima, and across the Upper Yakima River, striking the Columbia again a little below the Wenatchee; from this the trail ran along (still northwards) near the Columbia until it reached the Okanagan valley, up which it led to the Lake Osoyoos. Here the party struck off to the north-west up the Similkameen valley, and on arriving at the Ashtnolo, a mountain-torrent, ascended the ravine through which it runs, and taking the tributary which led most directly to the southward, got close to the 49th parallel, in long. 120° W. The station here was 5480 feet above the sea, and about 2020 feet below the mountain-summits, the access to which was easy. From this point a party proceeded westward to Roche River, thus connecting the Survey with that of the preceding year from the west side of the Cascades.

The route from the Dalles which has just been mentioned, and along which collections were made, crosses several spurs of the Cascades, and the rivers named below the Okanagan have their sources in those mountains, and a short course from thence to the Columbia.

Returning to the Dalles: the other branch of the party kept on the left bank of the Columbia, from the Dalles to Walla Walla, and from thence proceeded northwards to the Snake River, which was crossed where it receives the Peloose. From that they went by the 'Big Lake' nearly due north to Colville, on the banks of the Columbia River.

Nearly the whole of this route was over an arid, comparatively barren and treeless region. Collections were here made at different points by Sapper Buttle.

In the summer of 1861 the line of country in which botanical collections were made ran southwards up the Colville valley, and then through a partially wooded country to the Spokan valley, a great part of which is destitute of trees, and partakes somewhat, in its productions, of the character of the barren grounds of the Columbia. Proceeding in a north-easterly direction, the trail next leads to the Pend Oreille River, which is here densely wooded on both sides, but has, in some places, between the forest and the river, pretty extensive meadow-grounds, which, in June, at the height of the floods caused by the melting of the snow in the mountains, are almost entirely covered with water. From Sinyakwateen, the crossing-place at the Pend Oreille River, the trail runs through a gloomy and almost grassless forest for about twenty or five-and-twenty miles to the Pack River, from whence to the Kootenay the forest is more open.

Along the valley of the Kootenay which we ascended the forest is in most places open, with no scarcity of grass on the right bank. The valley above the place where crossed is very narrow, with steep hills in some places rising abruptly from the river. Above the second crossing of the Kootenay at its south-east bend, and on approaching the Tobacco Plains, the river-banks become more rugged and thickly timbered and grass more scarce, until, suddenly, what was nothing more than a ravine opens out into a wide, almost treeless valley, with many of its plants similar to those of the dry grounds of the Columbia. The trail leading to the Boundary Pass of the Rocky Mountains merely crosses the lower corner of this open valley and enters shortly amongst the Galton Mountains, a range lying between the Kootenay and Flathead Rivers, and rising to an altitude of about 8000 feet above the sea. Crossing by a pass, which on the 17th of July had snow upon it, the trail runs down the eastern slope of the Galton Mountains to the Flathead River, which, at the place where it was forded, was found to be 4005 feet above the sea. The valley of the Flathead is partly clear of trees, and again affords indications of a comparatively dry climate. Immediately on crossing this valley, the Pass of the Rocky Mountains is entered upon. The ascent is at first very gradual until, in the very centre of the range, a steep hill comes in the way, the pass over which was found to be 6970 feet above the sea, wooded on both sides and with scattered stunted trees on the top. On the east side of this hill there is a steep descent to a glen which leads out by a comparatively gentle decline to the Buffalo Plains of the Saskatchewan. These plains, close to the foot of the mountains (the termination of which is very abrupt), are about 5000 feet above the sea.

The camp of the astronomical station on the Rocky Mountains was at an altitude* of 6180 feet, close to the 49th parallel; and from this the slaty summits of the mountains (8386 feet above the sea) could be reached, affording an excellent opportunity of forming a complete collection of the vegetation of this elevated region.

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* The altitudes given are from observations made by Mr. Bauerman, the Geologist of the expedition.

The longitude of the watershed, as determined by Captain Haig, is 114° 2′ 49″ W.

Botanical Aspects of the Regions traversed.

The harbours of Victoria and Esquimalt, at the south-east corner of Vancouver Island, in the immediate neighbourhood of which most of the plants collected in that island were found, are about three miles distant from each other, although one of the arms of the former is within a few hundred yards of Esquimalt. The country around them is rocky, in some places covered with pine forests, in others open and park-like, and more or less studded with oaks (*Quercus Garryana*, Doug.).

Around the shores of Esquimalt the following trees occur, viz.:—

Pinus contorta, *Doug.*
Abies Douglasii, *Lindl.*
—— Menziesii, *Lamb.*
Thuja gigantea, *Nutt.*
Taxus baccata, *L.*
Arbutus Menziesii, *Pursh.*
Cerasus mollis, *Doug.*
Quercus Garryana, *Doug.*

Arctostaphylos tomentosa is found on hills to the westward of the harbour. Species of *Acer*, *Betula*, *Alnus*, and *Salix* are plentiful. Among the more common shrubs are species of *Mahonia*, *Ceanothus*, *Acer*, *Nuttallia*, *Spiræa*, *Rubus*, *Rosa*, *Ribes*, *Vaccinium*, *Salix*, *Gaultheria*, &c.

Amongst the most conspicuous flowering-plants met with there in the early part of the season are several species of *Ranunculus*, of *Claytonia*, of *Potentilla*, and of *Saxifraga*, *Plectritis congesta*, *Collomia gracilis*, *Collinsia violacea*, *Dodecatheon Meadia*, *Sisyrinchium grandiflorum*, species of *Fritillaria*, *Camassia esculenta*, and species of *Trillium*.

The country gone over on the mainland may, for the convenience of botanical comparison, be, with propriety, divided into three principal regions:—

1st. The Lower Fraser River district, which includes the Sumass and Chilukweyuk prairies and other low grounds to the westward of the Cascade Mountains—a moist region.

2nd. The Columbia valley between the Dalles and Colville—a dry country, for the most part destitute of trees.

3rd. The higher regions of the Cascade and Rocky Mountains—regions of moisture.

The country intersected by the Boundary-line between the Cascade and Rocky Mountains partakes of the character of all these three regions. At the Colville River valley, and in the

Pend Oreille valley, we have an under-vegetation resembling in many of its features that of the Lower Fraser; whilst the productions of the Similkameen valley and the Tobacco Plains, and part of the Flathead valley, approximate to those of the dry region of the Columbia.

Such of the intervening mountain-ranges as we had an opportunity of examining afford specimens of alpine plants the same as were obtained on the Cascades and Rocky Mountains.

With reference to the *first* district, it may be mentioned that the line of separation between Washington Territory and British Columbia for the first twenty-five miles from the sea runs nearly parallel to the Fraser River, and at an average distance of less than ten miles from it. About twenty-four miles inland it strikes one of the spurs of the Cascades. Up to this point the ground is nearly level, but little above the sea, and densely timbered with trees mentioned below.

The Lower Fraser River has along its left or south bank a range of low rocky hills, extending from Langley to the mouth of the Sumass River; and to the southward of these, between them and the spur of the Cascades just mentioned, lies the Sumass prairie. Nearly in the middle of this prairie is the lake of the same name, about ten miles long by four broad at its widest part. During the season of flood it extends from hill-foot to hill-foot, and even after the subsidence of the waters its mud-banks or beaches reach certain points on both sides.

The larger half of the prairie is at the south-west end of the lake, and is (roughly) about four miles square.

The prairie-ground at the north-east end of the lake is bounded by a belt of trees separating it from the clear or prairie ground on the banks of the Chilukweyuk River. The clear ground on both sides of this river has been apparently formed partly by the repeated action of fires, destroying the trees which at one time grew on the higher banks, and partly by the action of the annual floods which overflow a large portion of it.

Most of the collections made in the first district were from the Sumass and Chilukweyuk prairies and from the comparatively low adjoining hills.

These (so-called) prairies have, during the season of flood, more the appearance of immense lakes, being, with the exception of a higher ridge here and there, almost entirely covered by water. As soon as this retreats, the heat of the sun in July and August causes the Grasses and Cyperaceæ to grow with extraordinary luxuriance and rapidity, so that in the beginning of September, when we first visited this part of the country, it was with difficulty that we could believe that it had so recently been inundated, the grass having by this time in many places attained a height of between 5 and 6 feet, and being so dense as to render walking through it exceedingly tiresome.

The autumn of 1858 and part of the summer of 1859 were spent in these localities, and the greater portion of the plants collected were obtained from within a few miles of the Boundary-line on either side.

The banks of the Lower Fraser River and (with the exception of the clear grounds above mentioned) the whole of this district are densely covered with forest, many of the trees in which attain a very large size.

The trees most commonly met with are the *Abies Douglasii*, Lindl. (the Douglas spruce or fir), several specimens of which, measured in the neighbourhood of Sumass, were found to be nearly 30 feet in circumference at five feet from the ground. Two hundred and fifty feet was the measured length of one that had been blown down; but some which we saw must have been considerably higher than this.

The *Abies Menziesii* (Menzies' spruce or fir), a large tree, 25 to 30 feet in circumference, and at least 200 feet high.

The *Abies Mertensiana* (hemlock spruce of our axmen) is a common tree, growing to the height of 150 or 200 feet. Some trees were observed with a perfectly straight trunk of 60 or 70 feet high before giving off a branch.

The *Pinus contorta* is not uncommon here.

The *Thuja gigantea*, Nutt., known as the 'Cedar,' also attains a very large size in this neighbourhood. The circumference of one measured was 26 feet 9 inches at six feet from the ground, and the estimated height 250 feet. This and the Douglas fir are the most useful trees on this part of the coast. There is a large and increasing export of the Douglas fir, both as spars and lumber, from Puget's Sound as well as from Vancouver Island.

Various parts of the 'Cedar' are applied to different purposes by the Indians. The trunk is used to form their canoes, and, when split into slabs (which it is very easily), to build their permanent huts or lodges. The stringy bark and the integuments of the root are plaited into useful and ornamental articles of clothing and household utensils.

At intervals, interspersed amongst the trees already mentioned, we find small clumps or solitary specimens of the *Acer macrophyllum*, Pursh (large-leaved maple). This tree chooses the more open parts of the forest, where it sometimes attains a height estimated at 150 feet. The circumference of one measured was 20 feet. Along with this tree, as well as in other places, we meet with the *Acer circinatum*, Pursh, *Cornus Nuttallii*, And. (which grows to the height of 60 to 80 feet in all, with a straight trunk of 14 or 15 feet before branching, and a diameter of about a foot and a half), the *Alnus viridis*, DC., the *Alnus rubra*, Big. (a common tree, most plentiful in wet places), and the *Betula occidentalis*, Hook. (a tree growing to the height of 60 or 70 feet, and most common about the borders of the forest). Along the immediate banks of the Lower Fraser, on islands and on low grounds subject to annual overflow, narrow belts of poplar (*Populus balsamifera*, L.) of large size frequently occur.

The undershrubs of this district consist chiefly of the following:—

Mahonia, two species.
Acer glabrum, *Torr.*
Spiræa, several species.
Rubus, several species.
Ribes, several species.
Panax horridus, *Pl. & Dcne.*
Lonicera involucrata, *Banks.*
—— occidentalis, *Banks.*
Viburnum Opulus, *L.*
Vaccinium, several species.
Gaultheria Shallon, *Pursh.*

But in the denser parts of the forest no undergrowth exists, the spaces between the trees being filled up by others which have either been blown down by storms or laid prostrate by the hand of time. These are found in various stages of decay, and overriding each other at all angles, rendering progress through such woods in anything like a straight course impossible even for a man on foot and without any burden, and in any direction difficult and laborious. In the more open spots and along the borders of the forests, in addition to the shrubs above mentioned, the following are a few of the most characteristic plants, viz.:—

Anemone nemorosa, *L.*, var.
Aquilegia formosa, *Fisch.*
Dielytra saccata, *Nutt.*
Dentaria tenella, *Pursh.*
Circæa Lutetiana, *L.*
Tellima grandiflora, *Doug.*
Mitella caulescens, *Nutt.*
Tiarella trifoliata, *L.*
Linnæa borealis, *Gronov.*
Chimaphila umbellata, *Pursh.*
Pyrola, three or four species.
Monotropa uniflora, *L.*
—— lanuginosa, *Nutt.*
Arctostaphylos Uva-ursi, *L.*
Castilleja parviflora, *Bong.*
Rhinanthus minor, *Ehrh.*

Calypso borealis, *Salisb.*
Corallorhiza multiflora, *Lindl.*
Platanthera fœtida, *Geyer.*
Cypripedium parviflorum, *Salisb.*
Lilium Canadense, *L.*
Smilacina, three species.
Streptopus amplexifolius, *DC.*
Trillium grandiflorum, *Salisb.*

Along the banks of the Sumass Lake and River and lower part of the Chilukweyuk River, and on the clear grounds or prairies of the same name, besides numerous representatives of the families Junceæ, Carices, Gramineæ, &c., the following plants commonly occur, viz.:—

Ranunculus, several species.
Nuphar advena, *Ait.*
Viola, two or three species.
Stellaria, two or three species.
Cerastium, two species.
Silene Douglasii, *Hook.*
Claytonia, several species.
Geranium Carolinianum, *L.*
Impatiens pallida, *Nutt.*
Rhamnus Purshianus, *DC.*
Cerasus emarginata, *Doug.*
—— demissa, *Nutt.*
Geum macrophyllum, *W.*?
Agrimonia Eupatorium, *L.*
Potentilla, two or three species.
Fragaria, two or three species.
Rubus, several species.
Cratægus sanguinea, *Pall.*
Pyrus rivularis, *Doug.*
Amelanchier Canadensis, *Torr. & Gr.*
Epilobium, several species.
Ribes, several species.
Philadelphus Lewisii, *Pursh.*
Sium lineare, *Mx.*
Cicuta virosa, *L.*
Œnanthe sarmentosa, *Nutt.*
Angelica arguta, *Nutt.*?
Symphoricarpus racemosus, *Mx.*
Sambucus pubens, *Mx.*
Viburnum Opulus, *L.*
Cornus Canadensis, *L.*
Galium, four species.
Plectritis congesta, *Nutt.*
Compositæ, various.
Apocynum, two species.
Menyanthes trifoliata, *L.*
Lithospermum pilosum, *Nutt.*
Mimulus moschatus, *Doug.*
—— luteus, *L.*
Castilleja, two species.
Prunella vulgaris, *L.*
Scutellaria, two species.
Stachys, two species.
Plantago major, *L.*
Polygonum, several species.
Populus tremuloides, *Mx.*
Corylus rostrata, *Ait.*
Salix, several species.
Alisma Plantago, *L.*
Sagittaria variabilis, *Engl.*
Sisyrinchium, two species.

In the *second* region, which extends on one side of the Columbia from the Dalles to the Spokan River, and on the other side runs up through the Okanagan valley and crosses the 49th parallel at Lake Osoyoos and the Similkameen, the vegetation is of a very different character from that met with on the other side of the Cascade Mountains, and bears indications of a much drier climate. A good many of the plants found in this region are strictly local in their distribution. Excepting by the banks of lakes or streams, there are no trees; and some of the orders, such as Ranunculaceæ, Caryophyllaceæ, Portulaceæ, Rosaceæ, Crassulaceæ, Saxifragaceæ, Vacciniaceæ, Orchidaceæ, Liliaceæ, &c., of which species are so plentiful in the first region, have here comparatively few representatives, whilst others, such as Leguminosæ, Onagraceæ, Polemoniaceæ, &c., are more common in this district and give a character to the vegetation; the genera of many other orders are about equally numerous in both.

The following is a list of plants observed only on the comparatively barren grounds of the Columbia valley and in the neighbourhood of the Dalles and Walla Walla, with their geographical distribution:—

Delphinium azureum, *Mx.* United States.
Pæonia Brownii, *Doug.* N.W. America only.
Vesicaria Ludoviciana, *DC.* Local.
Ceanothus integerrimus, *H. & A.* Local.
Glycyrrhiza glutinosa, *Nutt.*? Local.
Petalostemon macrostachyus, *Torr.*
Trifolium fimbriatum, *Lindl.* Local.
—— variegatum, *Nutt.*? Local.
Hosackia stolonifera, *Lindl.* Local.
—— decumbens, *Bth.* Local.
Astragalus succumbens, *Doug.* Local.
—— lentiginosus, *Doug.* Local.
—— Canadensis, *L.* E. and W. of Rocky Mountains.
Phaca podocarpa, *Hook.* Local.
Lupinus leucophyllus, *Doug.* Local.
Thermopsis fabacea, *DC.* Local, and Kamtschatka.
Œnothera albicaulis, *Nutt.* Oregon and Saskatchewan.
—— triloba, *Nutt.*? Red River and Arkansas.
—— parvula, *Nutt.* Local.
—— andina, *Nutt.* Local.
—— densiflora, *Lindl.* Local.
—— quadrivulnera, *Doug.* Local.
Silphium? læve, *Hook.* Local.
Balsamorhiza hirsuta, *Nutt.* Local.
Helianthus petiolaris, *Nutt.* Only Missouri and Arkansas.
Layia glandulosa, *H. & A.* Local.
Antennaria dimorpha, *Nutt.* Local.
Stephanomeria minor, *Nutt.* Platte River.
Gilia Hookeri, *Bth.* Local.
Lithospermum ruderale, *Doug.* Local.
Amsinckia lycopsoides, *A. DC.* Local.
Eritrichium leucophæum, *A. DC.* Local.
Heliotropium Curassavicum, *L.* Generally distributed.
Pentstemon triphyllus, *Doug.* Local.

Pentstemon acuminatus, *Doug.* Local.
Orthocarpus hispidus, *Bth.* Local.
Anoplanthus fasciculatus, *Endl.* Saskatchewan.
Abronia mellifera, *Doug.* Platte River.
Eriogonum angustifolium, *Nutt.* Local.
—— vimineum, *Doug.* Local.
—— elatum, *Doug.* Platte and New Mexico.
—— compositum, *Doug.* Local.
Rumex venosus, *Pursh.* Missouri and Louisiana.
Euphorbia glyptosperma, *Engl.*? E. and W. of Rocky Mountains to New Mexico.
Hesperocordon hyacinthinum, *Lindl.* Local.

The *third* district comprehends the higher regions of the Cascade and Rocky Mountains, including the Galton Range, which lies near the latter, between the Tobacco Plains of the Kootenay and the Flathead River. The highest points at which we had an opportunity of collecting were on the Cascades at 7500 feet, and on the Rocky Mountains at about 8300 feet.

The following is a list of plants which were found to be almost if not entirely confined to those mountains, at a height of at least 4000 feet above the sea, with their geographical distribution:—

Anemone alpina, *L.* Arctic N. America. Cold N.E. and N.W. America and Europe.
—— parviflora, *Mx.* Arctic E. and W. America. Cold E. America.
Ranunculus Eschscholtzii, *Hook.* All Arctic Regions. N. Europe, N. Asia, N.E. and N.W. America, and Himalaya.
Caltha leptosepala, *DC.* Local. Cascade and Rocky Mountains, and northwards.
Trollius patulus, *Salisb.* Siberia.
Aquilegia Canadensis, var. fl. yellow. Local.
Turritis stricta, *Grah.* Columbia valley.
Draba alpina?, *L.* All Arctic Regions. Mountains of cold Europe, Asia, and America, and Himalaya.
—— lævipes, *Hook.* Rocky Mountains only.
Parnassia fimbriata, *Banks.* Rocky and Cascade Mountains, and northwards.
—— palustris, *L.* All Arctic Regions except Greenland. Cold Europe, Asia, America, and Himalaya.
Arenaria nardifolia, *Ledeb.*, var. glandulosa. Arctic E. and W. America. Siberia.
—— verna, *L.*, var. All Arctic Regions. Cold Europe, Asia, and America.
—— arctica, *Stev.*, var. All Arctic Regions. Cold Europe, Asia, and America.
Stellaria borealis, *Big.* Arctic Europe and E. and W. America. Cold Europe, Asia, America, and Himalaya.

Stellaria longipes, *Gold.* All Arctic Regions. Cold Asia and E. and W. America.

Silene acaulis, *L.* All Arctic Regions. Cold Europe and W. America, and tops of White Mountains in United States.

Lychnis apetala, *L.* All Arctic Regions. All cold Asia and America. Himalaya. Antarctic America.

Talinum pygmæum, *A. Gr.* Rocky and Cascade Mountains only.

——, n. sp.? Cascade Mountains only.

Spraguea umbellata, *Torr.* Cascades and California only.

Spiræa pectinata, *Torr. & Gr.* Arctic W. America.

—— corymbosa, *Raf.*, var. β. Cold E. and W. America and Kamtschatka.

Dryas octopetala, *L.* All Arctic Regions. Cold Europe, Asia, and America.

Geum strictum, *Ait.* Arctic Europe and Arctic E. America. Cold Europe, Asia, and America. Cold S. America. Himalaya. Australia.

Sibbaldia procumbens, *L.* Arctic Europe and Greenland. Cold Europe, Asia, and America, and Himalaya.

Potentilla diversifolia, *Lehm.* Rocky and Cascade Mountains, and northwards.

—— nivea, *L.*, var. γ. Arctic and cold Europe, Asia, and America, and Himalaya.

Epilobium alpinum, *L.* Arctic and cold Europe, Asia, and America, and Himalaya.

Sedum Rhodiola, *DC.* All Arctic and cold Europe, Asia, and America, and Himalaya.

—— stenopetalum, *Pursh.* Rocky Mountains and Platte.

Saxifraga bronchialis, *L.* Arctic Europe, Asia, and W. America. Cold Asia and Rocky Mountains.

—— cernua, *L.* Cold and Arctic E. and W. America, and Himalaya.

—— ranunculifolia, *Hook.* Cascade and Rocky Mountains, and hills near the Kettle Falls of the Columbia.

—— hyperborea, *Br.* Arctic and cold Europe, Asia, and America.

—— Virginiensis, *Mx.* Arctic E. America. Cold E. and W. America.

—— heterantha, *Hook.* Cascade and Rocky Mountains, and northwards.

—— Dahurica, *Willd.* Arctic W. America. Cold Asia. Rocky Mountains.

Mitella pentandra, *Hook.* Cascade and Rocky Mountains and California.

—— nuda, *L.* Arctic E. America. Cold Asia and E. and W. America.

Cymopterus, n. sp. Cascade Mountains only.

Valeriana capitata, *Willd.* All Arctic and cold Europe, Asia, and America, except Greenland.

Nardosmia palmata, *Hook.* Arctic and cold E. and W. America and N.E. Asia.

Aster salsuginosus, *Rich.* Arctic and cold E. and W. America.

—— Engelmanni, *A. Gray.* Rocky and Cascade Mountains.

Actinella acaulis, *Nutt.* East side of Rocky Mountains and Platte.

Senecio canus, *Hook.* N.E. and N.W. America.

——, n. sp.? near frigidus. Rocky Mountains only.

Arnica angustifolia, var. Arctic Europe and E. and W. America. Cold Europe, Asia, and America.

—— mollis, *Hook.* Rocky and Cascade Mountains.

—— Chamissonis, *Less.* Rocky and Cascade Mountains, and northwards. White Mountains of N. America.

Macrorhynchus elatus, *Nutt.*? Oregon and Cascade Mountains only.

Youngia pygmæa, *Ledeb.* Rocky Mountains. Arctic E. and W. America. Siberia.

Moneses grandiflora, *Salisb.* N.E. and N.W. America. Europe and Siberia.

Cladothamuus pyroliflorus, *Bong.* From the mouth of the Fraser River northward to Sitcha.

Menziesia Grahami, *Hook.* Rocky and Cascade Mountains.

—— glanduliflora, *Hook.* Rocky and Cascade Mountains, and northwards.

—— empetrifolia, *Sm.* Cascade and Rocky Mountains.

Andromeda (Cassiope) cupressina, *Hook.* Cascades to Sitcha.

—— tetragona, *L.* Arctic Europe, Asia, and America. Cold Asia and America.

Kalmia glauca, *Ait.* Arctic and cold E. and W. America.

Rhododendron macrophyllum, *Don.* Cascade Mountains and California.

—— albiflorum, *Hook.* Cascade and Rocky Mountains.

Ledum glandulosum, *Nutt.* Cascade and Rocky Mountains and California.

Gentiana Parryi, *Engl.* Cascade and Rocky Mountains, and southwards.

—— propinqua, *Rich.* Arctic and cold E. and W. America.

Polemonium pulcherrimum, *Hook.* Rocky Mountains. Arctic Europe. E. and W. America.

—— confertum, *A. Gr.* Rocky Mountains and southwards.

Myosotis sylvatica, *Hoff.* Arctic Europe, Asia, and America, but not Greenland. Cold Europe, Asia, and America, and Himalaya.

Eutoca sericea, *Hook.* Rocky Mountains only.

——, n. sp.? near Franklinii. Rocky Mountains.

Romanzovia Sitchensis, *Bong.* California. Unalaschka.

Pentstemon Menziesii, *Hook.* Vancouver Island, Cascade Mountains, and California.

—— confertus, *Doug.* Rocky Mountains and California.

Veronica alpina, *L.* Arctic Europe, Asia, and Greenland. Cold Europe, Asia, and America.

Pedicularis surrecta, *Bth.* California, Cascade and Rocky Mountains, and Hudson's Bay.

—— racemosa, *Doug.* Cascade and Rocky Mountains to California.

—— bracteosa, *Bth.* Cascade and Rocky Mountains. Saskatchewan south to Colorado.

Pinguicula vulgaris, *L.* Arctic Europe and E. America. Cold Europe and America.

Androsace septentrionalis, *L.* Arctic and cold Europe and Asia (Greenland excepted).

Dodecatheon dentatum, *Hook.*? Cascades only.

Eriogonum umbellatum, *Torr.* Cascade and Rocky Mountains south to Colorado River.

Oxyria reniformis, *Hook.* All Arctic and all cold Europe, Asia, and America, and the Himalaya.

Polygonum viviparum, *L.* All Arctic and all cold Europe, Asia, and America, and the Himalaya.

Betula glandulosa, *Mx.* Arctic and cold E. and W. America.

Salix cordata, *Mhlbrg.* Arctic and cold E. America. Cascade and Rocky Mountains.

—— glauca, *L.* All Arctic and cold Europe, Asia, and America.

—— arctica, *Pall.* Arctic and cold E. and W. America. Cold Asia.

—— phlegophylla, *And.* Arctic E. and W. America. Cold W. America.

—— reticulata, *L.*, vars. nana and vestita. Arctic and cold E. and W. America.

Pinus flexilis, *Torr.* Cascade and Rocky Mountains. Colorado.

Larix Lyallii, *Parl.*, n. sp. Cascade and Rocky Mountains.

Peristylus bracteatus, *Lindl.* Arctic Europe. Cold Europe, Asia, and N.E. America.

Xerophyllum tenax, *Nutt.* Rocky and Cascade Mountains.

Stenanthium, n. sp. Cascade Mountains. Kootenay River.

Juncus xiphioides, *Mey.* California. Cascades and Rocky Mountains.

Carex Mertensii, *Prescott.* Cascade Mountains.

—— canescens, *L.* Arctic Europe and E. America. Cold Europe, Asia, and America. Extratropical S. America. Australia.

—— comosa, *Boott.* Cascade Mountains. U.S. America.

—— verticillata, *Boott.* N.W. America.

—— tenella, *Schk.* Cold N.E. and N.W. America.

—— Nardina, *Fries.* Arctic Europe and E. America. Cold Europe and E. America.

—— Rossii, *Boott.* Cascade Mountains and Rocky Mountains. New Mexico.

—— scirpoidea, *Mx.* Arctic and cold E. America and cold Europe.

—— rigida, *Good.* Arctic Europe, Asia, and N.E. America. Cold Europe and E. America.

—— Lyallii, *Boott*, n. sp. Cascade Mountains.

—— cæspitosa, *L.* (*Boott*!) Arctic Europe. E. and W. America. Cold Europe, Asia, and America.

—— atrata, *L.*, var. Arctic Europe. E. and W. America. Cold Europe and Asia. Top of White Mountains in America. Himalaya.

—— nigricans, *Mey.* Rocky Mountains.

Scirpus cæspitosus, *L.* Arctic Europe. E. and W. America. Cold Europe, Asia, and America.

Alopecurus alpinus, *L.* Arctic and cold Europe, Asia, and America, and cold S. America.

Cinna pendula, *Trin.* Cascade Mountains. Amoor River; Siberia; Norway; Middle Russia; Sitcha.

Trisetum subspicatum, *Beauv.* Arctic Europe and E. and W. America. Cold Europe, Asia, and America. Andes; Himalaya; Australia.

Poa alpina, *L.* Arctic Europe and E. and W. America. Cold Europe, Asia, and America, and Himalaya.

Polypodium alpestre, *Hoff.*

The plants gathered by us at the eastern base of the Rocky Mountains which we did not also obtain from other localities are so few in number, that it appears hardly necessary to notice them in this report. They are the following, viz.:—

Geranium albiflorum, *Hook.* (Hookerianum, *Walp.*)
Astragalus pauciflorus, *Hook.*
Oxytropis splendens, *Doug.*
Hedysarum boreale, *Nutt.*
Actinella acaulis, *Nutt.*
Alopecurus alpinus, *L.*

Of these, the only one which has not also a locality assigned to it to the westward of the Rocky Mountains is *Oxytropis splendens.*

Notes on the Distribution of the principal Trees met with near the 49th degree of Latitude, and the Elevation to which they reached, between the Gulf of Georgia and the Rocky Mountains.

Pinus monticola, Doug., was found in Vancouver Island, as well as in the Lower Fraser River district, and is a common tree in the wooded valleys lying between Colville and the Rocky Mountains.

Pinus contorta, Doug., is very common in various situations in Vancouver Island as well as on the mainland. On the east side of the Cascade Mountains it forms the great bulk of the forest between the altitudes of 4500 and 6500 feet above the sea, where the size of large trees is about 1½ foot in diameter and 60 or 70 feet high. On the Rocky Mountains it was observed at 7000 feet above the sea. Along both sides of the trail in the passes of the Galton and Rocky Mountains, many of the young trees of this species are stripped of their bark from a foot or so above the ground to a height of six or seven feet. This is done by the Indians, during their annual hunting-excursions from the Kootenay and Kalispelm country to the Buffalo Plains on the east side of the Rocky Mountains, for the sake of the inner bark, which they use as food, as well in its fresh state as when compressed into thick cakes so as to render it portable. Near the south-east end of Vancouver

Island this tree is common in rocky situations and on promontories exposed to the gales of the Straits of Fuca, where it varies considerably in size, being for the most part stunted, but in some places attaining a height of 50 or 60 feet.

Pinus flexilis, Torr., was first observed by us near the eastern summit of the Cascade Mountains, about 7000 feet above the sea, where it was found as the highest tree of the forest belt, growing amongst rocks and granite débris, exposed to the full force of the storms which so frequently sweep over this elevated region. Here it was quite stunted and shrubby in its habit. The trunk of the largest seen in this situation was about 15 feet high, bulging out a little for a foot or so above the ground, then tapering pretty rapidly, and spreading out at the top into a number of thickish branches. No cones of this tree could be found on the Cascades; in the following year, however, they were procured both on the Galton and Rocky Mountains in great plenty, but unfortunately all too young for the seed to be of any use. The seed, which is about the size of a pea, is sweet and palatable, and is eaten by the Indians. This tree was found growing on the Rocky Mountains at an elevation of 8000 feet.

Pinus ponderosa, Doug. Immediately on penetrating to the eastward of the Cascade Mountains this fine tree was met with, but was not seen on the Pacific side of that range. It extends from the eastern slope of the Cascades, where individual specimens were seen as high as 3600 feet, to the base of the Rocky Mountains. Its most common associate along this line of country is the *Larix occidentalis*. Wherever these are found growing together, the ground is usually more or less level (flat land, or hills of no great steepness), covered with grass, and so open as to render progression easy, without confining the traveller constantly to the cleared and beaten trail, as is always the case in the forests west of the Cascade Mountains.

In the district spoken of, narrow valleys and ravines, as well as the steep sides of hills with northern exposures, are mostly inhabited by species of *Abies*, with which the *Pinus ponderosa* and Larch do not care to mingle; and in these situations no grass is to be found, although the prairie-ground extends to the very margin of the bank or ravine.

About Colville the *Pinus ponderosa* rivals in usefulness the Douglas fir on the coast, and is applied to most of the same purposes. This was the tree used on several occasions to form canoes to enable our parties to cross the deeper rivers, and it answered the purpose very well, being easily dug out, but it floated rather deep in the water.

Abies Mertensiana, Lindl. (Hemlock spruce of our axmen), one of the most common trees on the west side of the Cascades, is also met with on the east side, but is not so common, nor does it attain the same height as near the coast.

Abies Menziesii, Lamb., is common all along the line from the Pacific to the Rocky Mountains. It is one of the common trees already mentioned as existing in the ravines between the latter and the Cascades. On the Cascade Mountains it was observed at a height of about 5500 feet above the sea, and on the Galton and Rocky Mountains it was found as high as 6000 feet.

Abies Douglasii, Lindl., is usually found along with the preceding. This tree, which is such a giant in the Lower Fraser River district, becomes stunted and dwarfish on exposed promontories and at great elevations. It ceases to be common at an altitude of about 5500 feet above the sea, but scrubby specimens were seen on the Cascades nearly 2000 feet higher than that. It never attains the same proportions east of the Cascade Mountains that it does on the other side.

Abies amabilis, Doug., is not uncommon on the Cascade Mountains up to 6000 feet, and on the Rocky and Galton Mountains was found at an elevation of 7000 feet.

Abies grandis, Doug.?, was seen on the Cascade Mountains, and on their spurs running down to the Columbia River.

Picea nobilis?, Don (*balsamea*?), was found on the Cascade Mountains, near Lake Chilukweyuk. It is a large and handsome tree, with a soft wood easily cut by the axe. The bark, especially of the young, is smooth and shining, and covered with blisters containing a turpentine or balsam-like fluid.

Larix Lyallii, Parl. (n. sp.). First seen on the Cascade Mountains, where, at from about 6500 to 7000 feet, it formed in one place an open belt of trees, towards the upper part mingled with and afterwards overtopped by the *Pinus flexilis*. On the Galton Range it was found under the same circumstances at an altitude of about 6000 feet, and on the Rocky Mountains at 7000 feet. In the latter situation it was associated with the *Pinus flexilis* and the *Abies amabilis*.

Larix occidentalis, Newb. (an Nutt.?), occurs frequently between the Cascade and Rocky Mountains, associated with the *Pinus ponderosa*; and as the *Pinus ponderosa* here supplants for many purposes the Douglas fir, so the larch, from its splitting so easily, is applied to many of the uses fulfilled by the *Thuja gigantea* ('Cedar') on the other side of the Cascades, such as making shingles, rails for fences, &c.

Thuja gigantea, Nutt., which, as already mentioned, is common and grows to a very large size near the sea-coast, is comparatively scarce in the interior, where it is only met with in damp, shady ravines, or near moist river-banks such as those of the Pend Oreille; but even there it seldom attains a size at all to be compared with that which it reaches on the western side of the Cascades.

Juniperus Virginiana, L., occurs occasionally in the form of a tree in Vancouver Island, as well as along the boundary up to the Rocky Mountains. The measurements of one at Esquimalt were —circumference at six feet above the ground, 5 feet 4 inches; length of same tree (which had been blown down) 46 feet. Lowest branch five feet from the ground.

Acer macrophyllum, Pursh, one of the ornamental trees of the western forests, was not observed to the eastward of the Cascade Range.

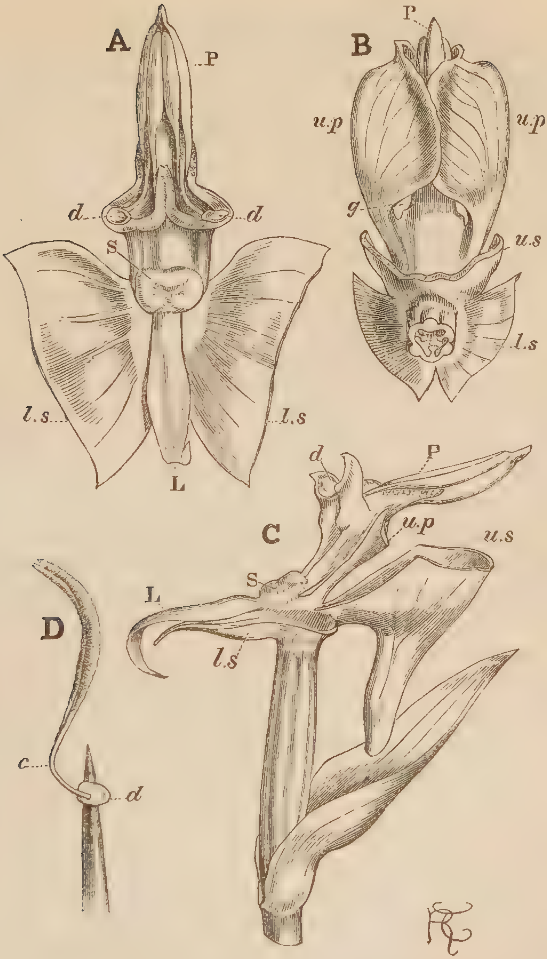
Quercus Garryana, Doug. (the only Oak seen), which is plentiful at the S.E. end of Vancouver Island, was not found on the mainland anywhere along the 49th parallel. It was seen in the neighbourhood of the Dalles, but did not extend much higher on the Columbia.

On the Fertilization of *Disa grandiflora*, Linn. By ROLAND TRIMEN, Esq., of the Colonial Office, Cape Town: drawn up from Notes and Drawings sent to C. DARWIN, Esq., F.L.S., &c.

[Read June 4, 1863.]

As none of the many various South African Orchids have been described in relation to their manner of fertilization, I have thought that a brief account of the structure of the *Disa grandiflora* might be acceptable.

In the great majority of Orchids the labellum, or lower lip, secretes nectar, and stands in front of the column which bears the stigma and pollen-masses. In the *Disa* the labellum is greatly reduced in size; the posterior sepal, on the other hand, is largely developed, and forms a spur which contains nectar. As the nectary thus stands at the back of the column (see fig. C) behind the stigma and pollen-masses, in a directly opposite position to that which it occupies in other Orchids, it may naturally be asked,



A. Column viewed in front, showing the labellum, with the two lower sepals partly cut off; the two upper petals and upper sepal wholly removed.

B. Back view of column, showing the two upper petals: the upper sepal is cut off so close that the nectary is not shown.

C. Side view of the column and ovarium, with the labellum viewed edgeways; with the upper petals and upper sepal partly cut away, with the spur or nectary left.

D. Pollinium, attached to a needle, viewed laterally.

P. pollinium.
d. disc of pollinium.
c. caudicle of pollinium.
S. stigma.

L. Labellum.
u. p. upper petals.
u. s. upper sepal with nectary.
l. s. lower sepals.
g. gateway or passage leading to the nectary, between the upper petals and the column.

How can insects effect the fertilization of the flower? This is effected with marvellous simplicity by a very slight change in the form of the two upper petals, and in the position of the viscid discs of the pollen-masses.

The upper sepal is of large size, with the basal margins folded inwards, and these, together with the two upper petals which overlap each other behind, enclose the column, so that insects, to reach the nectar, are compelled to approach the flower in front, in precisely the same manner as if the labellum secreted nectar. But as the column stands in the way of the nectary, insects must push their probosces or heads on either side of it, in order to reach the nectar. The flower is manifestly constructed to favour this action; for the two upper petals have narrow bases, which leave a small open gateway on each side of the column, as may be seen in the drawing (B) of these two petals and of the back of the column. In all common Orchids the two viscid discs, to which the pollen-masses are attached, stand close together or are some way removed from each other; but they always face either the base or the sides of the labellum. In the *Disa* the two discs are widely removed from each other, and face outwards from the labellum towards the margins of the column, as may be seen in the front view (A) of the flower.

It is impossible to doubt the meaning of this unusual position of the discs; for they are thus seated on the inner margins of the two gateways or passages which lead to the nectary. If a needle be inserted through one of these passages, it inevitably touches the extremely viscid disc of that side; and when the needle is withdrawn, the pollinium is withdrawn. In figs. A and C the position of the medial stigma, seated some way beneath the discs, may be seen; and in fig. D the shape of the elongated pollinium, attached to a needle, is shown, with the caudicle bent almost at right angles near to the disc. In most British Orchids, when the pollinia are removed from their cases, the caudicles undergo a movement of depression, caused, as described by Mr. Darwin, by the contraction of the discs; and at the same time they bend either outwards or inwards, always in strict relation to the position of the stigma. In the *Disa* there is no movement of this nature, but the end of the much-elongated pollinium bends downwards, from its weight, and is brought towards the centre of the flower by the crookedness of the caudicle; so that when a needle, with a pollinium attached to it, is inserted into the passage leading to the nectary, the end of the pollen-mass strikes the stigma and leaves pollen-grains on its sticky surface. Thus in the *Disa*, notwithstanding the remarkable difference in the position of the nectary, every part of the flower, by the aid of very slight modifications, has become neatly coordinated to ensure fertilization through the agency of insects.

The *Disa* carpets with its narrow lanceolate leaves the margins of the almost dry watercourses on the southern spur of the Table Mountain. In February its superb flowers expand. When I examined the plants, most of the flowers were partially withered ; but in the greater number, even in those quite withered, both pollinia were still in their cases ; in not one instance had both been removed ; but in several flowers one had been carried away. In some of the withered flowers the pollinia protruded from the anther-case ; and in a few instances the upper sepal, in curling inwards, had touched the disc and had drawn out the pollinium : but I saw no case in which the pollen-grains had thus reached the stigma. Considering how well stored the nectary is with honey, it is surprising that the flowers are not more regularly visited ; but as the nectar fills the lower part alone of the nectary, only insects with a long proboscis could reach it ; and perhaps the larger moths are rare at the elevation at which this plant grows. The remarkably brilliant colours, however, of the flower probably indicate that it is attractive to some day-flying Hymenopterous or Lepidopterous insect. However this may be, the infrequency with which the pollen-masses are removed offers a nearly parallel case to that described by Mr. Darwin, of the extremely imperfect fertilization of the *Ophrys muscifera* in England.

On the *Musci* and *Hepaticæ* from the Cameroons Mountain and from the River Niger. By WILLIAM MITTEN, A.L.S.

[Read June 18, 1863.]

THE species here enumerated appear to represent a Moss vegetation similar to that of tropical America ; in a few instances they are apparently identical, but for the most part they are rather cognate forms ; with those found at the Cape they appear to have but a small affinity. On the higher parts of the Cameroons Mountain the species are absolutely identical with those from the mountains of Abyssinia, intermixed with a few hitherto only known from the Island of Bourbon.

DICRANACEÆ, *Mitten.*

LEPTOTRICHUM, *Hampe.*

(*Distichium*, Bryol. Europ.)

L. CAPILLACEUM, *Hedw.*
Hab. Cameroons Mountain, alt. 7000 feet.

LEUCOLOMA, *Brid.*

L. SECUNDIFOLIUM, sp. nov. Dioicum, cæspitosum, caule ramoso, foliis falcatis secundis e basi latiore sensim longe angustatis apice angustissimis marginibus apice minute serrulatis nervo angusto pallido excurrente, cellulis in folii medio oblongis superioribus obscuriusculis ad margines angustis elongatis hyalinis medium versus folii longitudinis limbum latiusculum formantibus longe infra apicem evanescentibus, alaribus pluribus quadratis fuscis, perichætialibus e basi oblonga convoluta subulatis, theca in pedunculo semiunciali rubro ovali cylindracea, peristomio dentibus brevibus ut plurimum trifidis.

Hab. Island of St. Thomas, lat. 0, *Mann.*

Pale glaucous green; stems two to three inches high, curved; leaves secund, at the apices of the stems falcate. A more robust species than *L. macrodon*, Hook.

DICRANUM, *Hedw.*

(*Pedunculus erectus.*)

D. OBLIQUATUM, sp. nov. Dioicum, cæspitosum, caule humili ramoso, foliis subsecundis e basi latiore sensim longe angustatis, nervo latitudinis folii partem tertiam occupante fere ad apicem a pagina distincto, apice dorso marginibusque serrulatis, cellulis alaribus a reliquis non discretis, basi oblongis rectangularibus, ad nervum majoribus et spatium fere quartum folii basis occupante, inde oblongis, ad apicem rotundatis, perichætialibus e basi latiore oblongo-ovata convoluta subulato-attenuatis, theca in pedunculo elongato gracillimo luteo-viridi recto inclinata cylindracea inæquali viridi siccitate plicata, operculo subulato longe rostrato rubro, peristomio dentibus elongatis dicranis.

Hab. Peak Clarence, Fernando Po, on trees, *Mann.*

The foliage of this species resembles that of *D. fulvum*, Hook.; but the capsule is more like that of *D. Scottianum*, Turn., which is a much larger species. *D. flagellare*, Hedw., has leaves wider upwards, with a different structure at the base; in *D. obliquatum* the place of the alar cells is evident, but the brown enlarged cells appear to be dispersed through the base of the leaf in an irregular manner. The inclined capsule of this moss gives it a different appearance from any of its near allies.

(*Pedunculus flexuosus.*)

D. STRAMINEUM, sp. nov. Dense cæspitosum, caule elongato inferne fusco tomentoso parce ramoso, foliis erecto-patentibus e basi latiore sensim longe angustatis, marginibus integerrimis incurvis, nervo basi $\frac{3}{5}$ superne totam folii latitudinis occupante, cellulis alaribus pallide fuscis, inde ad latera angustis hyalinis, interioribus latioribus sensim superne in minutas oblongas rotundatasque transeuntibus, perichætialibus externis e basi ovata latiore internis e basi oblonga convoluta subulatis, theca in pedunculo cygneo flexu ovali æquali plicata, operculo subulato rostrato, peristomio dentibus rubris dicranis, annulo composito, calyptra basi fimbriata.

Hab. Cameroons Mountain, alt. 9000 feet, *Mann.*

Closely allied to *D. nivale*, Brid., but seems to differ in the less rigid foliage and more evident lamina of the leaf at the base. The stems are from two to three inches in height, and the foliage yellowish green and straw-coloured.

D. divaricatum, sp. nov. Laxe cæspitosum, caule erecto ramoso radicellis rubris tomentoso, foliis divaricatis lanceolato-subulatis apice serrulatis, nervo lato tertiam partem folii latititudinis occupante fere ad apicem a pagina discreto percurrente, cellulis alaribus numerosis a reliquis distinctis fuscis, basi ad nervum paucis oblongis ad margines brevibus quadratis, inde ad apicem parvis rotundatis.

Hab. Prince's Island, *Barter.*

Remarkable for its divaricate leaves, which when dry are incurved; it approaches *D. arenicolum*, C. Müller.

D. nivale, *Brid.*

Hab. Cameroons Mountain, alt. 9000–10,000 feet, on rocks, *Mann.*

D. ericetorum, *Mitten.*

Hab. Cameroons Mountain, alt. 7000–10,000 feet, on rocks, *Mann.*

These specimens are fertile; in the barren state the species is found in the warmer parts of Europe and the Atlantic Islands, but always without fruit.

Didymodon, *Hook.*

D. radicosus, sp. nov. Caule elongato, foliis e basi erectiuscula latiore recurvis squarrosis subsecundis lanceolatis nervo excurrente carinatis complicatisque, marginibus ad medium reflexis inde ad apicem serratis, cellulis basi elongatis pellucidis ad angulos brevibus quadratis superioribus rotundatis omnibus distinctis vix papillosis, perichætialibus exsertis longe convolutis, theca in pedunculo luteo flexuoso cylindracea pallida ore rubro, operculo subulato longirostro, peristomio dentibus angustis brevibus.

Hab. Cameroons Mountain, alt. 8000 feet, *Mann.*

Larger than its near allies, *D. squarrosus*, Hook., *D. sulphureus* and *D. aggregatus*, C. Müller. Leaves scarcely papillose, and cells everywhere with distinct pellucid interstices. Several rows of cells break up at the mouth of the capsule to form the annulus.

D. PUNGENS, sp. nov. Caule elongato ramoso, foliis e basi lata erecta sensim angustatis lanceolatis recurvis subsecundis complicatis, nervo in apicem tenuem excurrente, marginibus inferne reflexis apicem versus serratis, cellulis basi elongatis angustis sublævibus pallidis ad margines superioribusque omnibus minutis rotundatis subobscuris minutissime papillosis, perichætialibus interioribus erectis convolutis pellucidioribus, theca in pedunculo breviusculo gracili pallido ovali-oblonga erecta, operculo conico-acuminato, peristomio dentibus brevibus gracilibus.

Hab. Cameroons Mountain, alt. 10,000 feet, on rocks, *Mann.*

More slender than *D. radicosus,* and destitute of the rootlets amongst the leaves. The foliage, when dry, is nearly erect and appressed. The leaves are attenuated into a slender sharp point, and, excepting in two oblong spaces on each side of the nerve in the erect base occupied by the narrow elongated cells, they are everywhere nearly obscure.

D. FLEXIFOLIUS, *Hook. et Tayl.*

Hab. Cameroons Mountain, alt. 8000 feet, and on rocks inside the largest crater, Peak Clarence, Fernando Po, *Mann.*

D. PURPUREUS, *Hedw.*

Hab. Cameroons Mountain, alt. 8000 feet, *Mann.*

D. CYATHICARPUS, (Zygodon) *Mont.*

Hab. Cameroons Mountain, alt. 8000 feet, *Mann.*

This species was gathered in Abyssinia by Schimper.

LEUCOBRYACEÆ, *C. Müller.*

LEUCOPHANES, *Brid.*

L. UNGUICULATUS, sp. nov. Late cæspitosus, caule humili ramoso, foliis densis patentibus subsecundisve e basi concava latiore lanceolatis complicatis apice obtusis, nervo in apiculum brevissimum recurvum excurrente dorso lævi, margine tenui integerrimo, cellulis omnibus oblongis pellucidis.

Hab. Prince's Island, at the base of Oil Palms, *Barter.*

A little more robust than *L. glaucus* or *L. octoblepharoides,* from the more densely inserted leaves. The recurved point of the nerve, forming a small hook, is peculiar.

TRICHOSTOMACEÆ, *Mitten.*

ANŒCTANGIUM, *Hedw.*

A. SPATHULATUM, sp. nov. Cæspitosum, caule subsimplici radiculoso, foliis superioribus patentibus, apicalibus paululum recurvis elliptico-lanceolatis spathulatis, basi angustioribus nervo percurrente carinatis apice acutis integerrimis, cellulis parvis subobscuris basi ad nervum paucis oblongis pellucidioribus angulis decurrentibus, perichætialibus late ovatis acutis, theca in pedunculo elongato gracili pallido elongato-ovali cylindracea, operculo longe subulirostrato.

Hab. Cameroons Mountain, alt. 8000 feet, on the ground, *Mann.*

In size and habit like the larger states of *A. æstivum*, Hedw., but with its upper leaves narrowed at the base, and a rather more dense areolation.

TORTULA, *Hedw.*

T. CYLINDRICA, (Weissia) *Bruch.*

Hab. Cameroons Mountain, alt. 7000 feet, *Mann.*

SYRRHOPODON, *Hook. et Grev.*

S. ARMATUS, sp. nov. Dioicus, late cæspitosus, caule brevi ramoso radicellis purpureis tomentoso, foliis e basi erecta paululo latiore utrinque dentibus setiformibus 3–6 ciliata lineari-lanceolatis patentibus concavis apice acutatis integerrimis, nervo angusto dorso aspero in mucronem excurrente, cellulis calymperoideis spatium subellipticum folii basis totum occupantibus, inde ad apicem minute rotundatis obscuris, dorso papillosis, theca in pedunculo gracili bilineari ovali, operculo subulato subæquilongo, peristomio dentibus brevibus.

Hab. Bagroo River and banks of the Nunn, on dead bark, *Mann.*

Very near to *S. spiculosus*, Hook. et Grev., and *S. trachyphyllus*, Mont., but with leaves more narrow at the base (scarcely wider than the upper portion), the nerve evidently excurrent, the marginal cilia at the base longer.

S. LAMPROCARPUS, sp. nov. Caule elongato parce ramoso, foliis e basi erecta oblonga vaginante patentibus anguste subulato-lanceolatis, nervo pallido dorso lævi percurrente, margine in parte vaginante lato pallido, inde ad apicem angustiore serrulato, cellulis calymperoideis totum partis vaginantis occupantibus inde ad apicem minutissimis obscuris, perichætialibus conformibus apicibus ad basin thecæ cylindraceæ vermicularis attingentibus, pedunculo rubro, operculo longe subulato, peristomio dentibus rubris angustis, calyptra fere basin thecæ tegente.

Hab. Fernando Po, *Mann.*

Stems one inch and a half high, slender, apparently not growing in a tufted manner. Leaves very pale green, rather remotely inserted, unaltered in position when wet or dry; including the base, they are about three lines long. Whole plant a little more robust than *S. tristichus*, Nees ab E., with which it nearly agrees in general appearance.

CALYMPERES, *Swartz.*

C. AFZELII, *Swartz.*

Hab. Banks of the Nunn, and Prince's Island, *Mann.*

GRIMMIACEÆ, *Mitten.*

Grimmia, *Ehrh.*

G. Abyssinica, *B. et S.*

Hab. Cameroons Mountain, alt. 12,000 feet, with *Bryum pallescens*, Schw., *Mann.*

The inflorescence in these specimens, as well as in those from Abyssinia, is monœcious, and not diœcious, as described by Müller, Synops. p. 772.

ORTHOTRICHACEÆ, *Mitten.*

Zygodon, *Hook. et Tayl.*

Z. semitortus, sp. nov. Dioicus, caule subunciali dichotome ramoso, foliis e basi brevi erectiuscula divergentibus semitortis elliptico-lanceolatis basi angustatis angulis decurrentibus integerrimis nervo sub apice latiusculo acuto evanescente carinatis, cellulis rotundatis distinctis sublævibus basi vix ullis diversiformibus, perichætialibus conformibus, theca in pedunculo 3–4-lineari ovali plicata, collo pyriformi, operculo subulato obliquo, peristomio ciliis 8 brevibus.

Hab. Cameroons Mountains, alt. 8000 feet, *Mann.*

A large species, resembling *Z. Reinwardti*, Schw., but with entire leaves.

Macromitrium, *Brid.*

M. levatum, sp. nov. Cæspitosum, ramis erectis ramosis, foliis patenti-recurvis siccitate tortis late lanceolatis, apice in mucronem acuminatis nervo percurrente carinatis, marginibus uno latere inferne reflexis superne minute crenulatis, cellulis basi elongatis angustis, nonnullis paulo supra basin grosse papillosis, medium versus in parvas rotundatas diametro circiter $\frac{1}{3000}$ uncii metientes læves transeuntibus, perichætialibus paulo latioribus erectis, theca in pedunculo elongato globoso-ovata collo sensim attenuato plicata, operculo conico subulato, calyptra nuda thecam totam tegente, peristomio simplici.

Hab. Cameroons Mountain, alt. 8000–10,000 feet, on trees and rocks, *Mann.*

Allied to *M. sulcatum*, Hook., and, like it and its near allies, with a small triangular mass of calymperoid cells on one side of the nerve at the base of the leaf. The capsule is slightly and irregularly plicate when old; before the fall of the operculum it is smooth.

M. Menziesii, sp. nov. *M. levato* simillimo, foliis late lanceolatis nervo excurrente carinatis, cellulis basi elongatis angustis papillosis superioribus rotundatis obscuris diametro circiter $\frac{1}{5000}$ uncii metientibus, theca in pedunculo elongato lævi basi plicata late ovata, operculo conico subulato, peristomio simplici, calyptra nuda.

Hab. Sierra Leone, *Menzies in Herb. Hooker.* Fernando Po and Island of St. Thomas.

Very nearly resembling the preceding species and *M. sulcatum*; but the

mature capsule is smooth and plicate only in the neck, and its leaves are of a more dense structure.

FUNARIACEÆ, *Mitten.*

ENTOSTHODON, *Schwægr.*

E. CURVIPES, *C. Müller.*

Hab. Cameroons Mountain, alt. 7000–8000 feet. Agrees exactly with the Abyssinian specimens.

FUNARIA, *Schreb.*

F. HYGROMETRICA, *Dill.* (F. calvescens, *Schw.*)

Hab. Cameroons Mountain, alt. 7000 feet.

BARTRAMIACEÆ, *Mitten.*

BARTRAMIA, *Hedw.*

B. STRICTA, *Brid.*

Hab. Cameroons Mountain, alt. 7000 feet, *Mann.*

B. COMMUTATA, *Mitten.* (B. patens, *Schwægr.* t. 62.)

Hab. Cameroons Mountain, alt. 12,000 feet, *Mann.*

Much confusion appears to surround this species. Schwägrichen figured it supposing it to be identical with Bridel's *B. patens,* from Magellan; and Bridel then refers to Shwägrichen's figure as representing his species. C. Müller (Synops. i. p. 497) refers it to *B. vulcanica,* Brid., an allied but distinct species with a short seta. Judging from the single perfect capsule on the present specimen, the species differs from *B. patens,* Brid., from Magellan, in the absence of an internal peristome; its leaves are also narrower and more nearly like those of *B. papillata,* Hook. f. et Wils., but they are not serrulate quite down to the shoulders of the vaginant portion, although the papillation is nearly similar.

B. HALLERIANA, *Hedw.*

Hab. Cameroons Mountain, alt. 9000 feet, *Mann.*

PHILONOTIS, *Brid.*

(*Bartramidula,* Bryol. Europ.)

P. WILSONI, *B. et S.*

Hab. Clarence Peak, Fernando Po, alt. 8500 feet, *Mann.*

BREUTELIA, *Schimp.*

B. GNAPHALEA, (Hypnum) *Beauv.*

Hab. Cameroons Mountain, alt. 12,000 feet, *Mann.*

The male flower has obtuse leaves; the fruit is not present.

B. DIFFRACTA, sp. nov. Laxe cæspitosa, caule ramoso, foliis e basi subquadrata superne latiore erecta subito divaricatis diffractisque longe lanceolatis sensim tenuissime acutis plicatis, marginibus serrulatis, nervo tenui excurrente, cellulis ubique elongatis angustis papillatis, basi ad angulos paucissimis, circiter tribus majoribus fuscis, perichætialibus minoribus e basi ovata lanceolatis levioribus, theca in pedunculo semiunciali horizontali subglobosa plicata gymnostoma, operculo brevi conico.

Hab. Cameroons Mountain, alt. 5000–9000 feet, on rocks, *Mann.*

Differs from *B. gnaphalea* in its leaves having the upper portion suddenly divaricate, the cells in the erect base all narrow and elongate; in *B. gnaphalea* the cells occupying a considerable space on each side of the erect base are shorter and wider than in other portions of the leaf.

This is the first occurrence of a gymnostomous species in this group of Bartramiaceæ.

BRYACEÆ, *Mitten.*

MIELICHHOFERIA, *Hornsch.*

M. OVALIS, sp. nov. Dioica, cæspitosa, caule brevi radiculoso, foliis imbricatis erecto-patentibus ovatis acuminatis integerrimis, rarius apice denticulo uno alterove instructis, nervo percurrente, cellulis laxis teneris, perichætialibus ovato-lanceolatis, theca in pedunculo gracili pallido globoso-pyriformi, operculo conico, peristomio dentibus subulatis pallidis, annulo composito.

Hab. Cameroons Mountain, alt. 10,000 feet, *Mann.*

Stems scarcely half an inch high, in compact tufts of a pale shining yellow. In the form of its capsule allied to *M. Jamesoni*, Taylor, but it is a larger moss.

M. BASILARIS, *B. et S.*

Hab. Cameroons Mountain, alt. 7000–8000 feet, *Mann.*

BRYUM, *Dill.*

(*Bryum.*)

B. JULACEUM, *Sm.*

Hab. Cameroons Mountain, alt. 7000 feet, *Mann.*

A few fragments with an *Anthoceros.*

B. ARGENTEUM, *L.*

Hab. Cameroons Mountain, alt. 8000 feet, *Mann.*

B. ALPINUM, *L.*

Hab. Cameroons Mountain, alt. 12,000 feet, *Mann.*

B. PALLESCENS, *Schwægr.*

Hab. Cameroons Mountain, alt. 7000–12,000 feet, *Mann.*

Specimens fine, and agreeing exactly with European and American states.

(*Brachymenium.*)

B. FLEXIFOLIUM, *B. et S.*

Hab. Cameroons Mountain, alt. 8000 feet, *Mann.*

B. SUBERECTUM, sp. nov. Monoicum, *B. Nipalensi* simillimum, foliis e basi angustiore elliptico-spathulatis acuminatis, nervo in mucronem excurrente, marginibus ubique late cartilagineis a basi ad medium revolutis inde ad apicem remote serratis, cellulis parvis late oblongis, theca in pedunculo elongato inclinata pyriformi sub ore parvo constricta, operculo conico acuminato, peristomio *Brachymenii.*

Hab. Fernando Po, *Mann.*

Closely resembling *B. Nipalense*, but with leaves more narrowed at the base, more broadly marginate. The operculum acuminate, not hemispheric.

B. SUBULIFERUM, sp. nov. Monoicum, laxe cæspitosum, caule subsimplici, foliis laxe dispositis patentibus elliptico-lanceolatis nervo excurrente longe subulatis, marginibus a medio remote serratis, cellulis elongatis ad margines seriebus pluribus angustioribus limbum tenuem concolorem formantibus, theca in pedunculo elongato gracili suberecta pyriformi, peristomio *Brachymenii.*

Hab. Island of St. Thomas, lat. 0, *Mann.*

More nearly allied to *Brachymenium lanceolatum*, Hook. fil. et Wils, than to any yet known African or American species, and agreeing with it in size and general appearance; its leaves are, however, of a different form, having their widest part just above the middle, and thence gradually narrowing into the hair-like point.

HYPNACEÆ, *Mitten.*

FABRONIA, *Raddi.*

F. PERSOONII, *Schwægr.*

Hab. Island of St. Thomas, lat. 0, *Mann.*

Growing on a species of *Physcia* similar or perhaps identical with *P. speciosa.*

HYPNUM, *Dill.*

(*Brachythecium*, Schimp.)

H. VELLEREUM, sp. nov. Dioicum, cæspitosum, caule procumbente ramoso, foliis sericeo-nitentibus teretiuscule imbricatis late ovatis concavis subulato-acuminatis, acumine semitorto, nervo tenui medio evanido, marginibus apicem versus minute serrulatis, cellulis elongatis basi ad angulos parvis concoloribus quadratis, perichætialibus erectis ovato-lanceolatis, theca in pedunculo lævi cylindracea erecta æquali, operculo conico acuminato, peristomio interno processibus angustis perforatis in membrana ad tertiam partem dentium longitudinis exserta, ciliis nullis.

Hab. Cameroons Mountain, alt. 8000 feet, *Mann.* Abyssinia, near Ankober, *Dr. Roler.*

Habit and size similar to that of the more robust states of *H. salebrosum*, Hoffm., but leaves more turgid and faintly plicate. In the erect cap-

sule and incomplete peristome, this species has the same ratio to *H. salebrosum* as *H. sericeum*, L., has to *H. lutescens*, Huds.

(*Eurynchium*, Schimp.)

H. SPICULOSUM, sp. nov. Monoicum, caule laxe cæspitoso fruticoso, pinnatim ramoso, foliis patentibus flaccidis suborbiculari-ovatis acuminatis rameis oblongo-ovatis breviter acuminatis marginibus serrulatis, nervo ultra medium evanido, cellulis elongatis, perichætialibus e basi oblonga erecta subulato-attenuatis patulis, theca in pedunculo elongato spiculoso aspero rubro ovali horizontali, operculo subulirostrato, peristomio interno ciliis singulis inter processibus æquilongis perforatis in membrana ad dentium dimidium exsertis.

Hab. Cameroons Mountain, on trees, *Mann.*

Resembling *H. Swartzii*, Turner, but with more attenuated branches, more flaccid leaves, and removed from its near vicinity by the inflorescence, and thus more nearly agreeing with *H. remotifolium*, Grev., *H. speciosum*, Brid., and *H. austrinum*, Hook. et Wils., all which are more robust and less fruticose.

METEORIUM, *Brid.*

M. SERRULATUM, (Pilotrichum) *Beauv.*

Hab. Fernando Po, *Mann.*

(*Cryptotheca*, Hsch.)

M. INVOLUTIFOLIUM, sp. nov. Caule elongato arcuato pinnatim ramoso, foliis imbricatis patentibus oblongis panduriformibus profunde concavis convolutis obtusis apiculo brevi convoluto terminatis nitidis, enerviis integerrimis, cellulis elongatis basi fuscis, alaribus paucis parvis fuscis obscuris.

Hab. Sierra Leone, *Barter*; also in *Herb. Hooker.* from the same place, given by the Horticultural Society.

Stems three inches long, branches about one inch long, somewhat similar to *M. Vitianum*, Sullivant, but less rigid, and leaves more elongate and obtuse, and the apiculus is shorter.

M. IMBRICATUM, (Pilotrichum) *Beauv.*

Hab. Cameroons Mountain, alt. 4000–7000 feet; Clarence Peak, Fernando Po, alt. 8000 feet, on trees, *Mann.* Sierra Leone, *Barter.*

TRACHYLOMA, *Brid.*

T. STIPITATUM, sp. nov. Ramis erectis dendroideis, stipite elongato, ramulis in fronde obliqua planiuscula dispositis, foliis hastatis compressis subquadrifariis substriatis late ovatis obtusis acutatis plicatis appressis, nervo tenui ad $\frac{3}{4}$ evanido, apice dorso prominente dentiformi, marginibus serrulatis, cellulis elongatis omnibus conformibus, floribus masculis gemmiformibus in ramis primariis secundariisque dispositis.

Hab. Fernando Po, alt. 7500 feet, *Mann.*

Very similar to the larger states of *T. arcuatum*, Hedw., but with the nerve abrupt below the apex of the leaf, and standing out as a small tooth.

STEREODON, *Brid.*

(*Pylaiesia*, Schimp.)

S. ABYSSINICUS, (Leptohymenium) *B. et S.*

Hab. Cameroons Mountain, alt. 7000-8000 feet, on trees, *Mann.*

(*Theca pendula.*)

S. MOLLICELLUS, sp. nov. Dioicus, laxe late cæspitosus, ramis procumbentibus elongatis ramulis brevibus pinnatis, foliis falcatis secundis e basi latiore sensim angustatis lanceolatis, nervis binis fere obsoletis, apice parce serrulatis subintegerrimis, cellulis elongatis angustis, basi ad angulos paucis abbreviatis, foliis ramulinis circinatis integerrimis, perichætialibus elongatis lanceolatis subulatis serrulatis, theca in pedunculo longissimo gracili apice curvato ovali pendula.

Hab. Cameroons Mountain, alt. 4000–5000 feet, *Mann.*

Rather less, but habit and appearance similar to that of *S. ichnotocladus*, C. Müller; leaves of the ramuli more circinate and entire.

S. DIFFUSUS, sp. nov. Dioicus, late laxe cæspitosus, caule elongato depresso ramis brevibus pinnato, foliis compressis subsecundis e basi latiore sensim lanceolatis superne serrulatis nervis subobsoletis, ramulinis ovato lanceolatis, cellulis elongatis basi paucis abbreviatis, alaribus nullis, perichætialibus e basi ovato-lanceolata subulatis serrulatis, theca in pedunculo elongato gracili mutante, urceolata, peristomio magno, interno processibus solidis, ciliis binis subæquilongis interpositis in membrana ad $\frac{3}{4}$ dentium longitudinis exserta.

Hab. Prince's Island; Fernando Po, *Barter.*

Smaller than *S. mollicellus*, but with the same habit; leaves not so much narrowed upwards and serrulate, those of the ramuli not circinate, simply decurved, and also serrulate.

S. SCATURAGINEUS, (Hypnum) *Brid.*

Hab. Banks of the Nunn, and Fernando Po, *Mann*; Prince's Island, *Barter.*

S. BORBONICUS, (Hypnum) *Bel.*

Hab. Banks of the Nunn, *Mann.*

This small but most distinct moss is found intermixed with many other species from these regions.

S. PAPILLOSUS, (Hypnum) *Hornsch.*

Hab. Banks of the Nunn, on charred wood, *Mann.*

After comparison with original specimens from South America, no appreciable difference is observable.

S. PLANUS, (Hypnum).

Hab. Niger, *Vogel.*

S. HOMALOPHYLLUS, sp. nov. Monoicus, cæspitosus, caule vage subpinnato, foliis plano-compressis ovali-oblongis acutis obtusisve enerviis margine uno latere inflexo superne serrulatis, cellulis elongatis levibus alaribus utrinque tribus majoribus, perichætialibus ovato-lanceolatis serrulatis patulis, theca in pedunculo elongato-ovali collo curvato inclinata horizontalive, operculo conico acuminato, peristomio interno processibus solidis, ciliis singulis brevioribus interpositis in membrana ad $\frac{1}{3}$ dentium longitudinis exserta.

Hab. Niger, on roots in a rivulet, *Barter*.

Larger than *S. planus*, (*Hypnum*) Brid.; foliage more compressed, leaves with cells destitute of the papillæ so evident in that species.

(*Plagiothecium*, B. et S.)

S. NITIDIFOLIUS, sp. nov. Monoicus, ramis ascendentibus ramosis, foliis patentibus compressis ovato-lanceolatis plerumque asymmetricis acutis integerrimis, nervis binis brevibus, angulis decurrentibus, cellulis angustis elongatis latitudine circiter $\frac{1}{4000}$ longitudine $\frac{24}{4000}$ uncii metientibus basi paucissimis laxioribus, perichætialibus erectis conformibus, theca in pedunculo gracili brevi ovali inclinata, operculo conico acuto, peristomio interno processibus ciliis binis brevibus interpositis, in membrana fere ad dentium dimidium producta.

Hab. Clarence Peak, Fernando Po, alt. 8000 feet, on trees, *Mann*.

Pale green, shining, in habit and size resembling *S. denticulatus*, Dill., but with leaves more evenly tapering into the more acute point, not acuminate, and cells half as wide, and nearly twice as long as in that species.

(*Hylocomium*, Schimp.)

S. FRUTICELLUS, sp. nov. Monoicus, intricatus, caule erecto inferne simplici superne in frondem bipinnatim ramoso apice descendente radicante prolifero, foliis caulinis remotiusculis patulis hastato-acuminatis substriatis, rameis patentibus hastato-ovatis argutius serrulatis, dorso parce denticulatis, enerviis, cellulis elongatis angustis alaribus nullis, perichætialibus patentibus e basi late ovata subito longe subulatis integerrimis, theca in pedunculo longissimo apice curvato ovali æquali horizontali pendula, operculo brevirostrato, peristomio interno processibus solidis ciliis tribus dimidio brevioribus in membrana ad $\frac{2}{6}$ dentium longitudinis exserta.

Hab. Fernando Po, alt. 3000–8000 feet, *Mann*.

Habit and size that of *S. reptans*, Sw., but distinct in the more lanceolate point of the cauline and wider branch-leaves.

S. FRONDOSUS, sp. nov. Monoicus, intricate cæspitosus, caule superne bipinnato ramulis decurvis, foliis caulinis subsecundis latissime cordato-ovatis apiculo brevi curvato concavis margine hic illic plano minute serrulato, nervis binis teneris brevibus, cellulis elongatis angustis apicibus dorso prominentibus, rameis imbricatis late ovatis acuminatis concavis marginibus planis argute serrulatis, nervis longioribus, cellulis magis prominentibus basi paucis abbreviatis, perichætialibus e basi erecta ovata sensim lanceolato-attennuatis subintegerrimis patulis, theca in pedunculo longissimo rubro ovali inæquali horizontali pendulave, operculo conico longirostrato, peristomio interno processibus solidis ciliis singulis ejusdem longitudinis in membrana ad $\frac{1}{3}$ dentium longitudinis exserta.

Hab. Fernando Po, alt. 3000–8000 feet, on stones up the mountain, *Mann.*

Habit similar to that of *S. fruticellus* and *S. reptans,* but more robust, and approaching small states of *S. tenuis,* (*Neckera*) Hook. The capsule is sometimes regularly plicate, but not uniformly so. Very near to *S. pseudoreptans,* C. Müller, but different in capsule and peristome.

Lepidopilum, *Brid.*

L. devexum, sp. nov. Monoicum, caule parce ramoso, foliis compressis, lateralibus inæqualibus divaricato-decurvis asymmetricis intermediisque ovato-lanceolatis, mediis æqualibus minoribus, nervis ad medium productis, marginibus a medio ad apicem serrulatis paululum recurvis, cellulis longitudine latitudinem duplo superantibus, perichætialibus parvis ovatis acuminatis, theca in pedunculo gracili brevi bilineari rugoso apice flexo horizontali ovali, peristomio dentibus subulatis interno processibus carinatis angustis dentium longitudinis basi in membrana brevi exserta, calyptra sublævi subintegra.

Hab. Cameroons Mountain, alt. 4000 feet, *Mann.*

In size and appearance similar to *L. latifolium,* Müller, and the numerous closely allied South American species; but differing from all in its capsule being horizontal from the curvature of the very short seta, which is rugose, not papillose, and in the calyptra, which is more nearly smooth and entire than is usual in the genus.

L. versicolor, sp. nov. Monoicum, caule depresso ramoso, foliis compressis, lateralibus patulis subarcuatis oblongo-lanceolatis apice latiusculo acutis, mediis intermediisque paulo brevioribus sursum angustioribus acutioribus ad medium binervatis, cellulis oblongis mollibus inferne longioribus, marginibus apice dense serrulatis, perichætialibus brevibus lanceolatis pedunculo elongato gracili sub collo thecæ ovali-cylindraceæ horizontaliter ruguloso, operculo conico acuminato, peristomio interno processibus solidis ciliis nullis.

Hab. Fernando Po, *Mann.*

Near to *L. Utacamundianum,* Mont., but with narrower leaves and smaller cells.

NECKERACEÆ, *Mitten.*

Neckera, *Hedw.*

(*Climacium,* Mohr.)

N. longirostris, *Hook.*

Hab. Cameroons Mountain, alt. 7000 feet.

Very incomplete specimen, but not distinguishable from the South American species.

N. ramulosa, sp. nov. Gracilis, ramis bipinnatis, foliis compressis ovato-oblongis acuminatis ramulinis rotundato-ovatis, nervo ultra medium producto, marginibus a medio ad apicem argute subduplicato serrulatis, cellulis superioribus oblongo-rotundis inferioribus elongatis, perichætialibus apicibus subulatis.

Hab. Cameroons Mountain, alt. 4000 feet, amongst *Radula bipinnata*, Mann.

A slender species allied to *N. flagellacea*, Mitten, but with narrower leaves.

(*Rhystophyllum*, Ehrh.)

N. disticha, *Hedw.*
Hab. Fernando Po, *Mann.*

N. foveolata, *Mitten.*
Hab. Bagroo River, *Mann.*

N. pennata, *Hedw.*
Hab. Peak Clarence, Fernando Po, alt. 6000 feet, on trees, *Mann.*

N. remota, *Bruch.*
Hab. Cameroons Mountain, alt. 7000 feet, on trees, *Mann.*
Agrees exactly with the Abyssinian specimens.

LEUCODONTACEÆ, *Mitten.*

Hedwigia, *Ehrh.*

(*Hedwigium*, Schimp.)

H. imberbis, *Hook. et Taylor.*
Hab. Cameroons Mountain, alt. 10,000–12,000 feet, on rocks, *Mann.*

H. rupestris, sp. nov. Monoica, cæspitosa, caule elongato ramoso, foliis caulinis erecto-patentibus imbricatis ovato-ellipticis acutis apice serrulatis marginibus inferne anguste reflexis longitudinaliter rugosis, rameis in apiculum flexuosum filiformem attenuatis, cellulis minutis rotundatis, perichætialibus erectis longioribus ovato-lanceolatis plicatis, theca in pedunculo semiunciali gracili late ovali pluries plicata, ore levi, operculo conico, rostro subulato, calyptra elongata bi- trifida uno latere profundiore pluries plicata.

Hab. Cameroons Mountain, alt. 10,000 feet, on rocks, *Mann.* "Ad rupes prope Enschedcap," inter cæspites *H. Schimperianæ*, No. 464, *Unio Ilmeraria*, 1842, *Schimper.*

Size about that of *H. Indica*, Mont., but in all the specimens less regularly branched; easily distinguished from *H. Schimperiana* by its more acute leaves and plicate capsule.

LESKEACEÆ, *Mitten.*

LESKEA, *Hedw.*

(*Thuidium*, Schimp.)

L. INTRICATA, sp. nov. Monoica, intricate cæspitosa, caule phyllidiis brevibus sparsis, foliis patentibus latissime hastatis subulatis acuminatis minute serrulatis, nervo tenui in apice evanido, rami nudi, foliis hastato-ovatis acutis ramulinisque compressis ovatis obtusiusculis apiculo brevi, cellulis parvis rotundatis subobscuris papillis brevibus nervo sub apice evanido, perichætialibus erectis ovato-lanceolatis subulatis subintegerrimis lævibus, theca in pedunculo lævi elongato cylindracea subæquali suberecta, operculo subulirostrato, peristomio interno processibus elongatis in membrana brevi exserto, ciliis nullis.

Hab. Cameroons Mountain, alt. 7000 feet, on trees, *Mann.*

Allied to *L. Haplohymenia*, Hook, and to *L. leptoclada*, Taylor.

L. RAMUSCULOSA, sp. nov. Monoica, caule phyllidiis sparsis, foliis cauli latioribus latissime cordato-hastatis acuminatis, margine inferne planis superne crenulatis, nervo in apice evanido, ramis nudis, foliis late ovatis acutis, ramulinis ovatis obtusiusculis nervo sub apice evanido marginibus minute crenulatis, cellulis rotundatis obscuriusculis breviter papillosis, perichætialibus erectis e basi suboblonga superne dentato-lacera acumine subulato elongato serrulato, theca in pedunculo lævi elongato rubro horizontali cylindracea inæquali, peristomio interno processibus ciliis tribus interpositis in membrana ad $\frac{1}{3}$ dentium longitudinis producta.

Hab. Clarence Peak, Fernando Po, *Mann.*

Larger than *L. versicolor*, Hsch., and different from any described species, with monoicous inflorescence in the laceration of its perichætial leaves; among the dioicous species this character is frequently observable.

CALLICOSTELLA, *Mitten.*

C. AFRICANA, *Mitten.*

Hab. Fernando Po, *Mann.*

C. ABRUPTA, sp. nov. Dioica?, caule prostrato intricato gracili rigido, foliis oblongo-ovatis apice truncatis, nervis brevibus ad $\frac{1}{4}$ folii longitudinis productis, marginibus crenulatis, cellulis elongatis papillosis, perichætialibus oblongo-ovatis acutis, theca in pedunculo elongato cygnicolli flexu superne scabro ovali collo sensim attenuato pendula, operculo conico curvirostrato, peristomio interno processibus ciliis singulis brevioribus interpositis.

Hab. Fernando Po, *Mann.*

Less than its allies *C. cymbifolia*, Hampe, and *C. pallescens*, Hook. et Wils., but agreeing with them in the shortly nerved leaves.

RHACOPILUM, *Brid.*

R. MUCRONATUM, *Beauv.*
Hab. Fernando Po, *Barter.*

R. AFRICANUM, sp. nov. Dioicum, habitu staturaque *R. tomentosi,* foliis lateralibus ovalibus, nervo in mucronem excurrente, marginibus serrulatis, cellulis oblongis rotundisque distinctis viridibus, tegminalibus parvis e basi hastata subulatis serrulatis cellulis minoribus, perichætialibus teneris e basi latiore subito subulatis integerrimis, theca in pedunculo elongato trigono inclinata subhorizontali elongata plicata ore obliquo, operculo subulato rostrato, peristomio magno normali, calyptra pilosa dimidiata.
Hab. Cameroons Mountain, alt. 7000 feet, *Mann.*

Rather larger, but nearly resembling *R. tomentosum,* Schw. Capsule longer, and inflorescence different.

MNIACEÆ, *Mitten.*

FISSIDENS, *Hedw.*

F. VIRIDULUS, *Schw.*
Hab. Cameroons Mountain, alt. 7000 feet, on rocks, *Mann.*

F. MICROCARPUS, sp. nov. Monoicus, caule ramoso, foliis patentibus late lanceolatis obtusiusculis subundulatis, nervo pellucido sub apice evanido, lamina folii vera ad medium producta æquali, dorsali basi contracta non decurrente, omnium laminarum marginibus tenuissime crenulatis, cellulis distinctis diametro circiter $\frac{1}{3000}$ unciæ metientibus, theca in pedunculo gracillimo pallido minute ovali tenera erecta æquali, operculo subulato, peristomio dentibus brevibus subintegris dicranisque, calyptra mitriformi subscabra.
Hab. Banks of the Nunn, in large patches on bark, *Mann.*

Very near to *F. sciophyllus,* Mitten; but leaves more obtuse, not obscure; cells easily distinguished; capsule quite symmetric.

RHIZOGONIUM, *Brid.*

R. SPINIFORME, *L.*
Hab. Fernando Po, *Mann.*

MNIUM, *Dill.*

M. ROSTRATUM, *Schw.*
Hab. Fernando Po, *Mann.*

DALTONIA, *Hook. et Tayl.*

D. PATULA, sp. nov. Monoica, foliis patentibus late lineari-lanceolatis nervo ad $\frac{3}{4}$ evanido carinatis, margine e serie triplici cellularum elongatarum integerrimo, cellulis omnibus parvis rotundato-ovalibus pellucidis latitudine circiter $\frac{1}{3000}$ longitudine $\frac{6}{3000}$ unciæ metientibus, perichætialibus parvis ovatis, theca in pedunculo rubro-fusco papilloso inclinata obovata, operculo subulato longi-rostrato, calyptra fimbriata.

Hab. Clarence Peak, Fernando Po, alt. 7000 feet, with *Neckera pennata,* Hedw., *Mann.*

Similar to *D. marginata,* Griff., and to *D. ovalis,* Tayl. Cells small and short.

D. LONGINERVIS, sp. nov. Monoica, foliis patentibus siccitate substrictis angustis lanceolatis nervo sub apice evanido carinatis, margine e serie superne quadruplici inferne latiore cellularum elongatarum integerrimo, cellulis superioribus latitudine circiter $\frac{1}{4000}$ longitudine $\frac{3}{2000}$ unciæ metientibus, inferioribus elongatis angustis, theca in pedunculo brevi rubro-fusco superne papilloso ovali ad medium papillosa, operculo subulato rostrato, calyptra fimbriata.

Hab. Fernando Po, with *Lepidopilum devexum,* Mann.

Like *D. angustifolia,* Dzy. et Molk., but with the cells at the base of the leaf much longer; it is a larger species than *D. splachnoides.*

D. SPLACHNOIDES, *Hook. et Tayl.*

Hab. Clarence Peak, Fernando Po, with *Stereodon nitidifolius,* Mann.

Two or three stems only, which appear to correspond with the Irish species.

DISTICHOPHYLLUM, *Dzy. et Molk.*

D. PROCUMBENS, sp. nov. Monoicum, caule brevi procumbente, foliis lateralibus patentibus late spathulatis apice rotundatis, intermediis erecto-patentibus mediisque erectis oblongo-spathulatis, omnibus apice apiculo parvo terminatis, margine tenui limbatis, nervo tenui ultra medium evanido, cellulis superioribus rotundatis diametro circiter $\frac{1}{1000}$ unciæ metientibus, inferioribus oblongis, perichætialibus parvis obtusis, theca in pedunculo bilineari aspero minuta globoso-ovali collo elongato horizontali, operculo e basi conica tenui longe subulato, calyptra basi longe fimbriata.

Hab. Fernando Po, *Mann.*

Stems about half an inch high; leaves pale yellowish green, becoming brown in age. Nearly allied to *D. spathulatum,* Dzy. et Molk.

Mniadelphus, C. Müller, must give place to *Distichophyllum,* on account of its priority.

CYCLODICTYON, gen. nov.

Caulis repens, ramosus. *Folia* binervia, cellulis rotundis lævibus. *Fructus* lateralis. *Calyptra* mitriformis.

C. LÆTEVIRENS, (Hookeria) *Hook. et Tayl. Muscol. Brit. et auctorum.* Pterygophyllum ex parte, *Bridel.*

Hab. Clarence Peak, Fernando Po, alt. 8000 feet, on trees, *Mann.*

This genus is proposed to include a small group of species, all closely agreeing in habit and structure with *C. lætevirens.* They differ from the *Hookeria* founded by Smith on *H. lucens,* and from *Lepidopilum,* Schw.,

in the large rounded cells of their leaves. In this particular they agree with that group of species which correspond with the *Hookeria quadrifaria*, Hook. Musc. Exot. t. 109, and which have been described in the Antarctic Floras under Bridel's genus *Pterygophyllum*; but the habit is different and the entire appearance of the plants dissimilar.

HYPOPTERYGIACEÆ, *Mitten*.

Hypoterygium, *Brid*.

H. laricinum, *Hook*. (*quoad specimina Menziesiana*).
Hab. Fernando Po and Island of St. Thomas, *Mann*.
The inflorescence of this species is monœcious.

POLYTRICHACEÆ, *Schimp*.

Polytrichum, *Dill*.

(*Cephalotrichum*, B. et S.)

P. Simense, *B. et S.*
Hab. Cameroons Mountain, alt. 8000–10,000 feet, on the ground, *Mann*.

(*Eupolytrichum*.)

P. juniperinum, *Hedw*.
Hab. Cameroons Mountain, alt. 8000–10,000 feet, *Mann*.

P. commune, *L*.
Hab. Clarence Peak, Fernando Po, on the very summit, *Mann*.

HEPATICÆ.

Jungermannia, *L*.

J. dentata, *Raddi*.
Hab. Cameroons Mountain, alt. 7000 feet, *Mann*.

J. hirtella, *Weber*.
Hab. Cameroons Mountain, alt. 7000 feet, amongst *Dicranum ericetorum*, Mann.

J. Abyssinica, *Nees ab E*.
Hab. Cameroons Mountain, alt. 7000 feet, *Mann*.

J. geminifolia, sp. nov. Caule gracili repente, foliis oppositis directione divergentibus devexisque convexis ambitu ovatis obtusis, margine dorsali subrecto ventrali magis arcuato apice rotundato basi dorso ventreque connexis, cellulis grossiusculis intercalaribus distinctis.
Hab. Island of St. Thomas, creeping on *Sendtnera diclados*, Endl., *Mann*.

Very closely resembling *J. perfoliata*, Sw., in size, but apparently different in its more closely inserted leaves, which are more divaricate and more unequal-sided.

PLAGIOCHILA, *Nees et Mont.*

P. SQUAMULOSA, sp. nov. Ramis elongatis subpinnatim ramosis apice decurvis, foliis patentibus imbricatis subdeltoideis apice obtusis, margine dorsali inferne integerrimo recurvo arcuato apice totoque marginis ventralis denticulato, ubi in caule descendente crispulo squamulis amphigastriiformibus varie lacerulis, cellulis rotundatis æqualibus, perianthio obovato dorso alato. labiis rotundatis denticulatis, foliis involucralibus latioribus undulatis argutius dentatis.

Hab. Cameroons Mountain, alt. 7000–8000 feet, *Mann.*

Resembles *P. corrugata,* Nees ab E.; but the leaves are more rigid, undulated only at the base, and the margin more strongly toothed.

P. DICHOTOMA, *Nees ab E.*

Hab. Cameroons Mountain, alt. 4000 feet, *Mann.*

LEIOSCYPHUS, *Mitten.*

L. REPENS, sp. nov. Caule repente ramoso radiculoso, foliis explanatis late ovato-subrotundis apice rotundatis sinuve obtuso bidentatis basi cum amphigastrio sinu lato bidentato, dentibus intus uni- extus bi-denticulato uno latere coalitis, cellulis rotundatis limitibus tenuibus, intercalaribus distinctis, foliis involucralibus magis rotundatis apice subbidentatis basi saccatis, amphigastrio caulinis majore magis dentato, perianthio basi turgido apice compresso lævi, labiis breviter dentatis.

Hab. Clarence Peak, alt. 8000 feet, Fernando Po, on decayed wood, *Mann.*

Entire plant, including the peduncle and rootlets, dark brown. In size similar to *Lophocolea heterophylla,* Nees ab E.

LOPHOCOLEA, *Nees ab E.*

L. DEVEXA, sp. nov. Caule elongato parce ramoso, foliis sursum conniventibus directione (explanatis) devexis ovatis ovato-oblongisque margine ventrali rectiusculo integerrimo dorsali arcuato basin versus uni- bidentato, amphigastriis satis magnis late ovatis apice breviter bidentatis lateribus utrinque angulato-bidentatis, cellulis subrotundis, interstitiis grossis.

Hab. Island of St. Thomas, creeping on *Sendtnera diclados,* Endl., *Mann.*

Resembling very nearly *L. trapezoides* (*Chiloscyphus*), Nees ab E., but leaves more narrow.

L. COADUNATA, *Sw.*

Hab. Prince's Island, *Barter.*

L. BIDENTATA, *Nees ab E.*

Hab. Clarence Peak, Fernando Po, alt. 8000 feet, on trees, *Mann.*

L. MURICATA, Nees ab E.

Hab. Clarence Peak, Fernando Po, alt. 8000 feet (a few fragments only), *Mann.*

GYMNANTHE, *Tayl.*

G. DECIPIENS, (Jungermannia) *Hook.*

Hab. Peak Clarence, Fernando Po, alt. 8000 feet, *Mann.*

The habit and structure of this species seem to bring it more nearly to this genus than to *Plagiochila*, to which it was referred in the 'Synopsis Hepaticarum.'

G. BILOBA, sp. nov. Caule procumbente radiculoso apice sæpe stolonifero descendente curvato, foliis sursum conniventibus explanatisve, subobcordatis bilobis sinu subrectangulo lobis subovatis acutis rarius trilobis, cellulis rotundatis interstitiis crassiusculis.

Hab. Clarence Peak, Fernando Po, alt. 8000 feet, *Mann.*

Smaller than the preceding species and more creeping, but appearing to belong to the same genus.

LEPIDOZIA, *Nees ab E.*

L. SUCCIDA, *Mitten.*

Hab. Fernando Po, *Mann.*

PHYSIOTIUM, *Nees ab E.*

P. SPHAGNOIDES, *Hook.*

Hab. Island of St. Thomas, *Mann.*

SENDTNERA, *Nees ab E.*

S. JUNIPERINA, *Sw.*

Hab. Island of St. Thomas, *Mann.*

S. DICLADOS, *Endl.*

Hab. Fernando Po, *Mann.*

RADULA, *Nees ab E.*

R. BIPINNATA, sp. nov. Ramis elongatis bipinnatis rigidis ramulis divergentibus, foliis laxe imbricatis suborbiculatis apice obtusis obtuso-angulatisve lobulo parvo cauli transverse appresso basi auriculo latiusculo rotundato infra punctum insertionis descendente ambitu cordato angulo superiore obtuso, cellulis minutis rotundatis subobscuris, perianthio in ramis laterali parvo brevi labiis undulatis, capsula emergente.

Hab. Cameroons Mountain, alt. 4000 feet, *Mann.*

Branches three to four inches long, slender, and rigid. Perianth remarkably small.

R. TAMARISCINA, sp. nov. Caule gracili rigidulo ramis divergentibus bipinnato, foliis divergentibus late ovatis apice rotundatis lobulo parvo subquadrato rectangulato basi trans caulem protracto, cellulis parvis rotundatis.

Hab. Island of St. Thomas, on *Physiotium sphagnoides*, Hook., *Mann.*

A small brown species, agreeing in size, appearance, and ramification with *Frullania tamarisci*, N. ab E.

R. VOLUTA, *Tayl.*

Hab. Cameroons Mountain, alt. 8000 feet, *Mann.*

MADOTHECA, *Dumort.*

M. SUBDENTATA, sp. nov. Ramis dense pinnatim ramosis, foliis divergentibus oblongis margine ventrali paulo sinuatis apice denticulatis, lobulo oblongo spinuloso dentato basi auriculato, amphigastriis breviter ovatis apice denticulatis, perianthio ovato apice truncato ore dentato.

Hab. Cameroons Mountain, alt. 4000 feet, *Mann.*

Differs from *M. capensis,* Gottsche, in the denticulate leaves, lobule, and amphigastrium, and smaller cells. In size near to *M. platyphylla.*

LEJEUNIA, *Gottsche et Ldbg.*

(*Thysananthus*, Ldbg.)

L. TRIQUETRA, sp. nov. Caule dichotomo subpinnatove ramoso, foliis ovatis apice angulo subrecto acutis dentatis, margine dorsali subrecto, ventrali incurvo arcuato, lobulo parvo oblongo bidentulo, amphigastriis obovatis apice emarginatis subdentatis marginibus inferne recurvis, cellulis parvis ovali-rotundis, foliis involucralibus majoribus apice obtusioribus magis dentatis, amphigastrio magno apice dentato, perianthio triquetro angulis superne dentatis.

Hab. Bagroo River, on bark, *Mann.*

Similar in size and appearance to *L. spathulistipa* (*Thysananthus*), Ldbg.; but leaves more obtuse, less sharply toothed, and the lobule bidentate.

(*Phragmicoma*, Dumort.)

L. PAPPEANA, (Phragmicoma) *Nees ab E.*

Hab. Fernando Po, *Mann.*

L. ABBREVIATA, sp. nov. Cæspitosa depressa, ramis brevibus subsimplicibus, foliis decurvis oblongis apice rotundatis margine ventrali sinuatis basi lobulo parvo oblongo unidentato, cellulis parvis rotundatis, amphigastriis parvis oblatis suborbiculatisve integerrimis, foliis involucralibus conformibus, perianthio subterminali obovato compresso dorso uni- ventre bi-carinato, angulis lævibus.

Hab. Bagroo River, on bark, *Mann.*

A small brownish-green species, with branches about three lines long and scarcely a line wide. It resembles in form *L. Sagræana,* Mont., and *L. adplanata,* but is more rigid.

L. MONTAGNEI, *Gottsche.*

Hab. Island of St. Thomas, on *Sendtnera diclados,* Endl., *Mann.*

(*Lejeunia*, G. et L.)

L. ACUTA, sp. nov. Caule repente elongato ramoso, foliis patulis ovatis

acuminatis acutis, cellulis rotundis pellucidis, lobulo parvo saccato unidentato, amphigastriis rotundo-ovatis sinu angusto laciniis conniventibus acutis, foliis involucralibus conformibus, perianthio parvo terminali obovato superne quinquangulato carinis sublævibus.

Hab. Fernando Po, on lichens, *Mann.*

Pale yellow. Similar to *L. cerina,* L. et L., and its allies.

(*Acrogonia,* Mitt.)

L. CULTRELLA, sp. nov. Epiphylla maculas astroideas formans, foliis patentibus ambitu subellipticis margine dorsali arcuato subintegerrimo ventrali dentato subintegerrimove dente uno validiore supra apicem lobuli oblongi apice rotundati, amphigastriis ad basin in lacinias duas angustas divergentes divisis, perianthio suboblongo angulis brevibus acutis divaricatis, foliis involucralibus inæqualiter bilobis subdentatis amphigastrio oblongo breviter bidentato.

Hab. Cameroons River, on leaves, *Mann.*

Nearly allied to *L. cupulata,* Tayl., and resembling it in the form of the leaves, which are, however, less narrowed upwards, and the lobule is more oblong.

FRULLANIA, *Raddi.*

F. EMERGENS, sp. nov. Caule procumbente vage subpinnatim ramoso, foliis imbricatis suborbiculatis apice incurvis auriculo galeato compresso appendiculo magno descendente lævi, amphigastriis orbiculatis basi cordatis magnis breviter emarginatis, marginibus incurvis planiusculis, fructu terminali, foliis involucralibus cum amphigastrio coalitis apice paucidentatis, perianthio vix emergente oblongo acuminato compresso pluricarinato, carinis apice subundulatis.

Hab. Cameroons Mountain, alt. 8000 feet, *Mann.*

Closely allied to *F. Mundiana,* Ldbg. et G., and *F. hians,* L. et L., but more robust, scarcely pinnate, leaves more orbicular, amphigastria not undulated.

F. DEPRESSA, sp. nov. Caule procumbente vage pinnato, foliis imbricatis oblongo-orbiculatis apice incurvis, lobulo galeato compresso, appendiculo infra basin non producto, amphigastriis imbricatis rotundatis basi paulo angustioribus breviter emarginatis, marginibus incurvis, involucralibus cum amphigastrio oblongo subligulato breviter bifido coalitis apice acutis integerrimis, perianthio oblongo apiculato exserto compresso, dorso lævi, ventre bicarinato.

Hab. Cameroons Mountain, alt. 8000 feet, *Mann.*

Approaches more nearly to *F. gibbosa,* Nees ab E.; but the margin of the leaf does not descend below the lobule, and the amphigastria are different.

F. CORDATA, sp. nov. Ramis gracilibus rigidis strictis pinnatis ramulis brevibus patulis recurvis parce ramosis, foliis caulinis subdivergentibus suborbiculatis obtusis mucrone parvo incurvo basi cordato-auriculatis, marginibus integerrimis incurvis, lobulo parvo elongato cauli contiguo ad medium evoluto amphigastriis suborbiculatis basi cordatis appressis ad medium fere bifidis laciniis acutis marginibus ubique recurvis tecto, cellulis apice foliorum parvis rotundis medio oblongis ad insertionem majoribus hexagonis omnibus crasse limbatis, perianthio compresso dorso lævi ventre unicarinato, foliis involucralibus lobis oblongo-lanceolatis dentato-laceris.

Hab. Cameroons Mountain, alt. 8000 feet, *Mann.*

In size and habit allied to *F. cordistipula,* Nees ab E. The lobule in the ramuli more remote from the stem, and not covered by the amphigastrium.

F. ANGULATA, sp. nov. Ramis gracilibus flexuosis rigidis, ramulis remotis elongatis simplicibus pinnatis, foliis directione patentibus cauli involutis ovatis acutis, marginibus angulis obtusis subdentatis, cellulis rotundis intercalaribus distinctis basi paucis majoribus, lobulo angusto evoluto cauli contiguo, amphigastriis oblongis bifidis sinu laciniisque acutis marginibus recurvis medio carinatis basi auriculis parvis cordatis, perianthio compresso dorso lævi ventre unicarinato, foliis involucralibus amphigastrioque laciniis lanceolatis angulosis.

Hab. Cameroons Mountain, alt. 8000 feet, *Mann.*

Very near to *F. atrata,* N. ab E., but leaves more ovate and angulate.

F. SQUARROSA, *Nees ab E.*

Hab. Prince's Island, *Mann.*

PLAGIOCHASMA, *L. et L.*

P. AITONIA, *Ldbg. et Nees.*

Hab. Cameroons Mountain, alt. 7000 feet, *Mann.*

DUMORTIERA, *N. ab E.*

D. HIRSUTA, *Schw.*

Hab. Cameroons Mountain, alt. 4000 feet, Fernando Po, *Mann.*

TARGIONIA, *Raddi.*

T. HYPOPHYLLA, *L.*

Hab. Cameroons Mountain, alt. 7000 feet, with *Plagiochasma Aitonia,* Mann.

DENDROCEROS, *N. ab E.*

D. CRISPATUS, *N. ab E.*

Hab. Island of St. Thomas, *Mann.*

ANTHOCEROS, *Micheli.*

A. DICHOTOMUS, *Raddi.*

Hab. Cameroons Mountain, alt. 7000 feet, *Mann.*

Letter from W. Archer, Esq., F.L.S., to Sir W. J. Hooker, F.R.S., &c., on Tasmanian Tree Ferns.

[Read Nov. 19, 1863.]

Cheshunt, Deloraine, Tasmania,
September 22, 1863.

My dear Sir William,—I fully intended to write to you a long letter by this post, giving you information upon various points which I thought might prove interesting to you. The arrival of a visitor, to whom I had to give up most of my leisure, has deprived me, however, of the time which I should have devoted to the letter to you. I must therefore content myself with a brief account of the very remarkable fern trees which grow on the northern side of the mountain called Cumming's Head (or more properly Cummings's Head), on land adjoining my estate.

In the midst of a damp forest of gum-trees of various species, and among trees of the genera *Pomaderris*, *Pittosporum*, *Eurybia*, &c., are to be found many fern trees of the genus *Dicksonia*—the *Dicksonia antarctica* being the species growing there. Many of them have more than one crown; but there is one fern tree in particular, round the circumference of whose top I *counted* no fewer than nineteen crowns, and I calculated that within the circumference there must be half as many more, making about twenty-eight or twenty-nine crowns in all. I considered this the most wonderful fern tree in the world when I first saw it, and roughly estimated the number of crowns at fifteen or sixteen. Now I am satisfied that it is one of the wonders of the world. Well do I remember the smile of incredulity with which many Fellows of the Linnean Society at one of the meetings received my statement that I had seen a fern tree with ten crowns (for I heartily dislike exaggeration); but I hope that my excellent friend your son will take an opportunity of confirming my statement by my account written on the spot.

Strange to say, there is another fern tree of the same species near the former one, round the circumference of whose top I counted, just the other day, seventeen crowns, which would give a total of twenty-five. There are also two others within twenty or thirty yards of it, the one with seven and the other with six crowns. The fern tree with twenty-five crowns is a very singular one; for it seems to have been originally about sixteen feet high, and to have fallen, and broken at a height of nine feet from the ground, and then to have shot up straight from the fracture. It now stands about eight or nine feet high. W. Archer.

Memorandum on a presumed case of Parthenogenesis in *Zanthoxylum alatum*, Roxb. By DANIEL HANBURY, Esq., F.L.S.

[Read Nov. 19, 1863.]

IN January last Dr. Anderson brought under the notice of the Linnean Society a presumed case of parthenogenesis in a species of *Aberia*, a shrub of which, in the Botanic Gardens of Calcutta, bore a large crop of well-ripened fruits containing fertile seeds, though only pistilliferous flowers could be detected at the time of flowering.

A case of similar character has come under my own notice: an Indian species of *Zanthoxylum*, the *Z. alatum* of Roxburgh, a diœcious plant, flowered in my father's garden at Clapham in the spring of 1862. As I had examined the flowers without being able to detect stamens, and knew that no other plant of the same genus grew near, I was not a little surprised to find the ovaries swell and the berries attain their full development,—and still more so when, having carelessly placed three or four seeds in a pot of earth, a seedling *Zanthoxylum* made its appearance.

In the spring of this year the shrub, now removed from the conservatory to the open border, again flowered, and though subjected to a much more careful scrutiny than previously, I failed to discover upon it any other than pistilliferous flowers. Still the ovaries became enlarged, and the shrub again bears mature berries, some of which I now exhibit to the Society.

On the Plants of the Temperate Regions of the Cameroons Mountains and Islands in the Bight of Benin; collected by Mr. GUSTAV MANN, Government Botanist. By J. D. HOOKER, M.D., V.P.R.S. & L.S.

[PLATE I.]

[Read Nov. 5, 1863.]

THE last few years have been fruitful in contributions to our knowledge of the botany of the least known, and in the present state of science, most interesting portion of the globe, namely the interior and mountains of tropical Africa. The collections of

Welwitsch in Loanda, of Kirk and Meller during Livingstone's Expedition, of Vogel and Petherick in the White Nile region and Nubia, of Baikie and Barter in the Niger Valley, of Speke and Grant in their arduous journey through Eastern tropical Africa, and lastly of Gustav Mann on the shores, islands, and mountains of the Bight of Benin, are all of great extent, and abound in novelty and interest.

It is with the highest satisfaction that we have lately welcomed amongst us the first-named of these adventurous explorers, Dr. Welwitsch, who is charged by the King of Portugal with a mission to this country for the purpose of preparing his collections for publication; and it only remains for us to hope that the exertions now being made by Sir W. Hooker to induce the British Government to follow the example of His Majesty of Portugal, in securing the publication of our own collections, will be successful, and that the botanical results of so many expeditions, brought together at such great cost and at so great a sacrifice of life, may not be doomed to lie unpublished in our museums for want of the trifling sum requisite for rendering them available to science.

It is with the collections of Mr. Mann that I now propose to occupy the attention of the Society; and with but a small portion of them; for the general collection, amounting to several thousand species, would take many months of continuous labour to investigate fully and report upon. The whole of these, however, having been transmitted to Kew, partly by Earl Russell as Chief Secretary for Foreign Affairs, under whose auspices Mr. Mann first went to Africa, and partly by the Lords of the Admiralty, under whom his latter explorations were conducted,—I have felt it to be my duty to lay before this Society, with the least possible delay, an account of those portions of them which are most novel and interesting. These are, the forms of the temperate mountain-regions explored.

In the sixth volume of our Journal, the Society printed a brief account of the collections made by Mr. Mann in the upper regions of the lofty peak (Clarence Peak) which crowns the Island of Fernando Po, which I had the honour of laying before them. The very great interest of that Florula rendered it in the highest degree desirable that Mr. Mann should completely explore all those mountains of the Bight of Biafra, both insular and continental, which rise into the temperate region, and especially the Cameroons Peaks, which had never been ascended by any European, and which Mr. Mann, from the period of his first arriving on the coast of Africa, had resolved to scale at all hazards. The great scientific importance of the expedition having been represented by Sir W. Hooker to the Duke of Somerset, First Lord of the Admiralty (to which department of the Public Service Mr. Mann had then been transferred), thanks to that nobleman's enlightened views and to the late lamented Admiral Washington's recommendations, the necessary funds were provided; and in this as in his other expeditions Mr. Mann's exertions have been crowned with far greater success than has been the lot of any previous explorer of the West-African coast, Dr. Welwitsch alone excepted. It is not my purpose here to enter into any detail of the many difficulties and dangers, the privations, and all but fatal fevers that Mr. Mann, in common with every other explorer of the shores of the Bights of Benin and Biafra, has encountered; by prudence, temperance, and energy all have been successfully combated; and he has returned to this country, after upwards of three years' continuous journeyings in the most fatal climates in the world, in excellent health, and with the finest collections, whether as regards extent, or interest, or excellent preservation, that have ever been made in those regions.

Before proceeding to an account of the mountain plants collected, it is expedient to enumerate the localities and their elevations, and to record the dates, &c. of the several expeditions during which they were gathered.

Peak of Fernando, elevation 9469 ft. First ascent attempted on the east side, February 21st, 1860; reached 2000 ft. and was driven back by the natives. Second ascent, from the north side, commenced March 22nd; reached the summit April 3rd; descended April 13th. November 7th, attempted a third ascent; but on the 23rd, being deserted by his servants, descended. December 7th, made a fourth attempt, and reached the summit for the second time on the 5th; descended on the 21st. March 19th, 1862, started for the fifth time to ascend the Peak, reaching the summit for the third time; returned on the 25th March, after measuring the depth of the great crater on the summit (515 ft.). April 12th, 1862, made the sixth ascent; reached the summit on the 16th, and descended on the 23rd. March 5th, 1863, made the seventh ascent, reached the summit on the 8th, and descended on the 13th.

St. Thomas's Island was visited August 5th, 1861. On the 13th commenced the ascent of the Peak, whose summit (alt. 7500 ft., according to the Admiralty charts) was reached on the 22nd; left on the 26th. The loftiest part of the island consists of a very narrow ridge, and is accessible with great difficulty from the east side, from which side Mr. Mann attempted it. A species of *Podocarpus* was the most remarkable discovery. Robert Brown having long ago remarked the absence of Coniferæ in West tropical Africa, this discovery was of especial interest. The species is very nearly allied both to a Cape and to an Abyssinian one. Here also the magnificent *Musa Sapientum* var. *vittata* was discovered in a cultivated state, and living specimens sent to Kew (see Bot. Mag. t. 1510–1513). It is, according to Mr. Mann, a native of the Gaboon.

Prince's Island was visited on September 22nd, and left on October 26th.

Cameroons Mountains.—This noble group attains 13,100 ft. of elevation, and consists of many peaks, all of volcanic origin, crowning an irregular short littoral range. Some of the physical characters of the group have been described in a memorandum transmitted to the Secretary of State for Foreign Affairs by Consul Burton, who accompanied Mr. Mann on his second visit to this group. The account there given of this adventurous expedition seeming to imply that it was one planned and conducted by Consul Burton, to which Mr. Mann had attached himself, I have been desired by Mr. Mann to publish the accompanying statement of the facts of the case as communicated by himself:—

"January 7th, 1861.—Having been instructed to use every exertion to explore the Cameroons Mountains, I arrived at Ambas Bay * (the foot of the range), on a reconnoitring expedition, hoping to ascend if possible, but chiefly with the view of making arrangements for ascending at an earlier period during the following season. February 10th, ascended the mountains to the highest villages, Makunda and Bando; elevation about 2500 ft.; but being under orders to repair to the Bagroo River, to report on its timbers for the Admiralty, before the wet season set in, I was obliged to descend, having arranged to revisit the mountain in the ensuing season.

"December 13th, 1861, I left Victoria, the Baptist Missionary station, in Ambas Bay, and reached Bassumba, alt. 1119 ft. On the 15th arrived at Mapanya, alt. 2748 ft.; on the 17th camped at a spring at the base of the Peaks, above the forest, at 7376 ft. On the 18th ascended to the summit of one of the highest peaks (Mount Helen), alt. 9290 ft., and returned to Mapanya, where I was met on the following day by Mr. Saker, Signor Calvo, and Consul Burton, who, having followed me up the mountain, now joined my expedition. December 24th, again visited Mount Helen. January 3rd, 1862, reached the summit of the Cameroons Mountains—Mount Albert, alt. 13,100 ft., which had never before been visited by a European; was taken ill on the descent, and had to be carried down to Victoria. January 24th, again left Victoria for the mountains, and reached the top of Mount Victoria, alt. 12,861 ft., on the 29th, Mount Albert (my second visit), and Mount Hooker. On January 31st, Consul Burton descended, leaving me: I continued my explorations till February 18th.

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* "This was nine months before Consul Burton arrived on the coast of Africa."

" November 8th, 1862, left Victoria for a third expedition on the mountains, visited the summit twice, and returned to Victoria December 15th. On this occasion I examined the 'Burning Field' described by Consul Burton in his Report printed by the Foreign Office, and found the appearance to be caused by steam issuing from the ground, at an elevation of 12,967 ft. above the sea. December 30th, ascended Mount Etindet, alt. 5309 ft."

From Mr. Mann's descriptions, the Cameroons Mountains present a dense forest-region up to about 7000 ft., when open grassy fields succeed, with bushes of *Hypericum*, *Pittosporum*, *Adenocarpus*, *Pygeum*, *Leucothoë*, *Ericinella*, *Myrica*, and various herbaceous plants. The many peaks which rise above this elevation are either stony and barren (being all formed of lava scoriæ or basalt), or are dotted with tufts of grass and a few other herbaceous plants.

The most interesting plants from the highest summits are, *Umbilicus pendulinus*, *Silene*, *Trifolium*, *Galium Aparine* and *G. rotundifolium*, *Scabiosa succisa*, *Helichrysa*, *Veronicæ*, *Bartsia*, *Stachys*, *Trichonema Bulbocodium*, *Deschampsia cæspitosa*, *Poa nemoralis*, *Kœleria cristata*, and various other European and even British plants.

Sierra del Crystal.—This appears to be a low range of hills, nowhere exceeding 2000 ft. elevation, whose importance and altitude have, according to Mr. Mann, been much overrated by M. du Chaillu. On June 7th, 1862, Mr. Mann reached the Gaboon River, and on the 12th arrived at Corisco Bay (Ilobi Island). On the 4th July left Corisco for the interior hills; on the 13th reached the summit of Mount Maveya, alt. 1668 ft., erroneously supposed to be 5000 ft. high and the summit of the chain. The true summit is Mount Shomba, alt. 1767 ft. On the 28th, having crossed the Sierra, he reached the village of Mangetsi, about eighty miles in a straight line from the coast.

Mr. Mann desires publicly to express his great obligations to the various Spanish and Portuguese officials on the coast, and especially to Consul Hutchinson at Fernando Po, and to the Missionaries at Victoria (Ambas Bay), the Revs. Messrs. Saker and Smith, but for whose cordial aid the Cameroons Mountains could not have been successfully explored by any European at the time of his visit. At Corisco he was much indebted to Mr. Mackey of the American Mission, who rendered him active and essential service.

The number of plants collected during these and Mr. Mann's other expeditions on the coast, amounts to probably 3000 flowering species, of which 237, found at elevations above 5000 ft., are those with which I propose to deal in the present paper. Nearly half of this number (viz. 112) are new species, and upwards of half are from the Cameroons Peaks.

Excluding the few peculiar to St. Thomas's and Prince's Islands, we have on the Cameroons Mountains, at elevations above 5000 ft., 203 species, and on Fernando Po Peak 102, of which 68 are common to both localities. The Monocotyledons bear a larger proportion to the Dicotyledons on the Cameroons (1 : 2·3) than on Fernando Po Peak (1 : 3·2). The proportion of nondescript to the previously known species was nearly the same on the Cameroons (1 : 2·2) as on Fernando Po (1 : 2·3); but of the plants common to both localities the proportion of novelty is much smaller (1 : 2·8).

I have adopted the above-mentioned altitude of 5000 ft. as the lower limit of the Temperate Flora, because both on Fernando Po and the Cameroons Mountains the temperate forms preponderate largely at that elevation. In these mountains, however, as in all other tropical ones, on the one hand tropical genera and species ascend to this and to much greater elevations, and on the other some temperate forms descend considerably lower, than their respective temperatures would lead us to expect. This is partly owing to the very varied conditions of exposure, humidity, and temperature which may be found at the same elevation in a mountain-region traversed by gorges and ridges, and still more to the equable annual temperature favouring both the ascent of the tropical forms and the descent of the temperate. Thus we have—

1. Plants of purely tropical forms, ascending up to and above 5000 ft., but whose normal limit is below it. The most remarkable cases are—

		feet.			feet.
Stephania	to	7,000	Gynura	to	8,500
Drynaria	„	7,000	Cephalostigma	„	7,000
Clausena	„	7,500	Anthocleista	„	7,000
Brucea	„	7,500	Alectra	„	7,000
Gomphia	„	5,000	Sopubia	„	7,000
Schmidelia	„	7,500	Coleus	„	7,000
Desmodium	„	7,000	Leucas	„	8,000
Shuteria	„	7,000	Achyranthes	„	7,000
Dalbergia	„	5,000	Cyathula	„	10,000
Kalanchoë	„	7,000	Phyllanthus	„	7,000
Mukia	„	7,000	Urera	„	5,000
Loranthus	„	8,000	Peperomia	„	8,000
Ixora	„	5,000	Bolbophyllum	„	6,000
Mikania	„	7,000	Angræcum	„	6,000
Microglossa	„	7,000	Polystachya	„	6,000
Dichrocephala	„	10,700	Calanthe	„	5,000
Blumea	„	8,000	Commelyna	„	7,000

I have excluded here the annuals, which so often owe their upward extension to local circumstances that do not annually recur; as also all the Panicoid and Andropogonoid grasses. Also many genera which have almost equal claim to rank as temperate and as tropical, as *Pittosporum*, *Impatiens*, *Ilex*, *Vernonia*, *Celsia*, &c. &c.

From a tabulation of these, I find that there are, at elevations above 5000 ft.,—

	Genera.		Species.
Truly temperate forms	80	....	112
Temperate and tropical, or intermediate	36	....	60
Truly tropical	46	....	65

2. The temperate forms that descend below 5000 ft. are comparatively few. The principal are:—

		feet.			feet.
Clematis	to	4000	Adenostemma	to	2000
Hypericum	„	4000	Senecio	„	2500
Rubus	„	4000	Leucothoë	„	4000
Sanicula	„	4000	Ericinella	„	4000
Anthriscus	„	4000			

3. The following species are common to the Himalaya and mountains of Biafra :—

	feet.
Cardamine hirsuta	7–10,000
—— Africana	7,500
Cerastium vulgatum....	8,000
Drynaria cordata	7,000
Oxalis corniculata......	7–8,500
Tillæa pentandra	8,000
Sanicula Europæa......	4–7,500
Galium Aparine	7–10,000
—— rotundifolium	7–12,000
Scabiosa succisa	10,500
Adenostemma viscosum	2–1,000
Mikania chenopodiifolia	4–7,000
Dichrocephala latifolia ..	7,000
—— chrysanthemifolia	7,000
Blumea alata	7–8,000
Cephalostigma Perrotetii	7,000
Mæsa Indica	5–7,000
Cynoglossum micranthum	7–8,000
Myosotis stricta........	8–10,000
Limosella aquatica	9–10,000
Sibthorpia Europæa	7–7,500
Solanum nigrum	7–11,000
—— Indicum	6–7,000
Utricularia orbiculata ..	5,000
Rumex obtusifolius	7,000
Polygonum Nepalense ..	7,500
Achyranthes argentea ..	7,000
Parietaria Mauritanica ..	7–8,000
Loranthus Wightii	7,500
Luzula campestris	8–10,000
Isolepis capillaris	8–10,500
Microchloa setacea	7,000
Deschampsia cæspitosa	9–12,000
Aira caryophyllea	7–8,000
Poa nemoralis	7–10,000
Kœleria cristata........	8–12,000
Vulpia bromoides	7–10,000
Brachypodium sylvaticum	7,000
Andropogon distachyus..	7,000

In this list twenty-two out of the thirty-nine are European and for the most part British.

4. Genera and species found at elevations above 9000 feet :—

Thalictrum rhynchocarpum.
Cardamine hirsuta.
Silene Biafræ, n. sp.
Arenaria Africana, n. sp.
Sagina Abyssinica.
Hypericum angustifolium.
Adenocarpus Mannii, n. sp.
Trifolium subrotundum.
Rubus apetalus.
Umbilicus pendulinus.
Crassula Mannii, n. sp.
Pimpinella oreophila, n. sp.
Peucedanum Petitianum.
Vignaldia occidentalis, n. sp.
Anthospermum asperuloides, n. sp.
Galium Aparine.
—— rotundifolium.
Scabiosa succisa.
Dichrocephala oblonga.
Helichrysum Mannii, n. sp.
—— fœtidum.
—— chrysocoma.
—— globosum.
Senecio Barterii.
—— Clarenceana, n. sp.
Anisorhamphus hypochæroides?
Wahlenbergia arguta.
Lobelia acutidens, n. sp.
Leucothoë angustifolia β.
Blæria spicata.
Ericinella Mannii, n. sp.
Sebæa brachyphylla.
Swertia pumila.
—— Clarenceana, n. sp.
Myosotis stricta.

Limosella aquatica.
Veronica Mannii, n. sp.
Bartsia Abyssinica.
Micromeria punctata.
Calamintha Simensis.
Stachys aculeolata, n. sp.
Solanum nigrum.
Cyathula cylindrica.
Thesium tenuissimum, n. sp.
Habenaria præalta.
Trichonema Bulbocodium.
Geissorhiza alpina, n. sp.
Melanthium tenue, n. sp.
Cyanotis Abyssinica.
Luzula campestris.
Isolepis capillaris.
—— schœnoides.
Carex Æthiopica.
Vilfa montana, n. sp.
Deyeuxia Mannii, n. sp.
Deschampsia cæspitosa.
Aira caryophyllea.
—— pictigluma.
Avena lachnantha.
Poa nemoralis.
Kœleria cristata.
Vulpia bromoides.
Festuca Schimperiana.
Andropogon Mannii.

Total genera 56	British	38
	Other European	5
	Peculiar to Cape	1
	—— to Abyssinia	1
	Chiefly tropical	4

5. The European species found on the mountains of Biafra are the following. I have appended to each any real or apparent facility for aërial or casual transport which it possesses.

Ranunculus pinnatus, 8000 ft. (Achenes with hooked styles.)
Cardamine hirsuta, 7000–10,000 ft. (Seeds very minute.)
Cerastium vulgatum, 8000 ft.? (Ditto.)
Radiola Millegrana, 7000 ft. (Ditto.)
Oxalis corniculata, 7000–8500 ft. (Ditto.)
Umbilicus pendulinus, 7000–10,000 ft. (Ditto.)
Sanicula Europæa, 4000–7500 ft. (Carpels with hooked bristles.)
Galium rotundifolium, 7000–12,000 ft. (Leaves and stems with hooked bristles.)
—— Aparine, 7000–10,000 ft. (Ditto ditto and fruit.)
Scabiosa succisa, 10,500 ft.
Myosotis stricta, 8000–10,000 ft. (Hooked hairs on calyx.)
Limosella aquatica, 9000–10,000 ft. (Aquatic.)
Sibthorpia Europæa, 7000–7500 ft. (Minute seeds.)
Solanum nigrum, 7000–11,000 ft. (Seeds with great powers of vitality.)
Rumex obtusifolius, 7000 ft. (Hooks on fruiting perianth.)
Parietaria Mauritanica, 7000–8000 ft. (Minute seeds.)
Trichonema Bulbocodium, 7000–9000 ft. (Ditto.)
Juncus capitatus, 7000 ft. (Ditto.)
Luzula campestris, 8000–10,000 ft. (Ditto.)
Deschampsia cæspitosa, 9000–12,000 ft. (Ditto.)
Aira caryophyllea, 7000–8000 ft. (Ditto.)

Poa nemoralis, 7000–10,000 ft.	(Minute seeds.)
Kœleria cristata, 8000–12,000 ft.	(Ditto.)
Vulpia bromoides, 7000–10,000 ft.	(Ditto.)
Festuca gigantea, 8500 ft.	(Ditto.)
Brachypodium sylvaticum, 7000 ft.	(Ditto.)
Andropogon distachyus, 7000 ft.	(Ditto.)

Of these 27, all but the *Radiola*, *Juncus*, and *Festuca* are Abyssinian, and these latter are for the most part West-European forms.

The most remarkable features of the Temperate vegetation of these mountains are—

1. The poverty of the flora.
2. The preponderance of Abyssinian genera and species.
3. The considerable proportion of European plants.
4. The paucity of South-African genera and species.
5. The great rarity of new genera.
6. The absence of St. Helena types.

Upon each of these propositions I have a few general remarks to offer.

1. In the poverty of its flora the Cameroons range, &c. seems to partake of the characteristics of the Abyssinian Alps. We know far too little of the physical geography of either of these districts to hazard many conjectures upon this point, which must to a certain extent be dependent on the arid volcanic nature of the soil and the limited area of the temperate region. Mr. Mann spent many weeks, and at various seasons, in his explorations, and yet 237 flowering plants were all that rewarded his toil. Geological causes have probably had, in the case of the Cameroons Mountains, much to do with the dearth of species, some parts of the range even now presenting evidence of subterranean heat.

2. The preponderance of Abyssinian forms is proved by almost all of the genera and half the species being natives of Abyssinia, and by many other species being very closely related to, or obvious representatives of, plants of that country. There are, further, several of the genera and many of the species peculiar to Abyssinia and the peaks of Biafra.

3. The number of European genera amounts to 43, and species to 27, by far the greater part of which are British; and a few of them, as *Radiola Millegrana*, have not been found previously anywhere in the African continent*. Very few of them extend into South Africa. The greater part are Abyssinian; the remarkable exceptions being *Radiola*, *Scabiosa succisa*, *Luzula campestris*, and

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* Since this Paper was read, I have been informed by Mr. Munby that he has found *Radiola Millegrana* in one spot in Algeria.

Festuca gigantea, all of which, however, may have been hitherto overlooked in Abyssinia.

Considering the total isolation of these tropical African mountains from the European regions by hot, low deserts, the existence of these plants in common is most singular, and explicable under two hypotheses: 1st, Mr. Darwin's theory, which assumes that during the glacial epoch the plants of the northern zones were driven southwards into the tropics, and on the return of warmth they both retreated northwards and ascended the intertropical mountains; and 2nd, transport by aërial currents and birds—in favour of which is to be urged that, of the whole, six present structural adaptations for clinging to the plumage of birds, and all the rest have small or very minute seeds, likely to be transported in mud on the feet of birds. *Solanum nigrum* has rather larger seeds, but with remarkable power of retaining their vitality, and, further, is found in North Africa and many intermediate countries, as are several of the others.

4. The paucity of South-African types was alluded to in discussing the 76 species of the Fernando Po mountain. The great accession of species from the Cameroons has added but few Cape forms: the principal are, *Anthospermum*, *Anisorhamphus* (perhaps referable to *Hieracium*), a species of *Ilex*, *Lasiosiphon*, *Peddiea*, *Geissorhiza*, *Hypoxis*, and a few others.

5. Only one new genus has been found, *Ardisiandra* (see Plate I.)—a very well marked new form of Primulaceæ, not indicating an affinity with any other flora.

6. Of the peculiar genera and species of St. Helena not one has been found; and what genera are common to that island and these mountains are also natives of the Cape region, and far more abundant there.

Florula of the Peaks of Biafra at and above 5000 *feet elevation.*

1. RANUNCULACEÆ.

1. CLEMATIS SIMENSIS, *Fresen.* (*ante*, vi. 4).

Hab. Fernando Po and Cameroons Mountains, alt. 4000–8000 feet. (Fl. and frt. Dec.–Jan.)

Fruiting specimens are identical with Abyssinian. The Cameroons Mountains' individuals have the flowers as large as the Abyssinian.

2. THALICTRUM RHYNCHOCARPUM, *A. Rich* (*ante*, vi. 4).

Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 7000 feet. (Fl. and frt. Nov.)

3. RANUNCULUS PINNATUS, *Poir.*, var. *extensa.* Carpellis lævibus (*ante*, vi. 5).
Hab. Fernando Po, alt. 8000 feet. (Fl. Dec.)

2. MENISPERMACEÆ.

1. STEPHANIA HERNANDIFOLIA, *Wall.* (*ante*, vi. 5).
Hab. Fernando Po, alt. 3000–5000 feet. Cameroons Mountains, alt. 7000 feet. (Fl. and frt. Dec.)

3. CRUCIFERÆ.

1. CARDAMINE HIRSUTA, *L.*, var. *Simensis.* C. Simensis, *Hochst.*
Hab. Fernando Po, alt. 7500–8500 feet. Cameroons Mountains, alt. 8000–10,000 feet. (Fl. Nov.)

2. CARDAMINE AFRICANA, *Thunb.*, var. *pubescens.*
Hab. Fernando Po, alt. 7500 feet.

4. VIOLARIEÆ.

1. VIOLA ABYSSINICA, *Steud.*, var. *impunctata* (*ante*, vi. 5).
Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Jan.)

5. PITTOSPOREÆ.

1. PITTOSPORUM MANNII, *H.f.* (*ante*, vi. 5).
Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 4000–7500 feet. (Fl. Dec.; frt. Jan.)

The Cameroons specimens contain excellent fruit, from which I learn that the small capsules alluded to in the Fernando Po plant were imperfectly developed; those now sent are very similar to *P. Senacia* of Mauritius, from which, however, as before observed, the species differs widely in the inflorescence and small flowers.

6. POLYGALEÆ.

1. POLYGALA TENUICAULIS, *H.f.*, n. sp. Annua, patentim pilosa, caule gracili simpliciusculo elongato, foliis anguste lineari-lanceolatis, racemis multifloris secundis, bracteis bracteolisque minutis, floribus breviter pedicellatis, sepalis pilosis exterioribus late oblongis alis late obovatis triente brevioribus, carinæ crista brevi bilamellata, capsula obcordata emarginata pilosa.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov. and Dec.)
Herba spithamæa ad pedalem, ubique pilis patentibus tomentella v. hispidula, caule gracili teretiusculo debili superne sæpius diviso. *Folia* $\frac{1}{2}$–1″ longa, marginibus siccitate recurvis. *Racemi* 2–3″ long. *Flores* rubicundi (siccitate flavo-virescentes), nutantes, $\frac{1}{5}$″ longi. *Alæ* venosæ. *Carinæ* crista inclusa. *Capsula* membranacea, inclusa.

7. CARYOPHYLLEÆ.

1. SILENE BIAFRÆ, *H.f.*, n. sp. Erecta, pubescenti-tomentosa, foliis anguste linearibus, floribus suberectis, calyce anguste oblongo-campanulato atro-pubescente, lobis anguste oblongis subacutis, costis crassis atris, petalis calyce paulo longioribus pubescentibus, lamina parva ad medium 2-loba carnosa basi appendicibus 2 carnosis coronata, thecaphoro capsula triente breviore.

Hab. Cameroons Mountains, alt. 8000–10,000 feet. (Fl. Nov.)

Herba 1–3-pedalis, parce ramosa, ramis teretibus. *Folia* pollicaria et ultra, anguste linearia. *Racemi* 4–8-flori. *Flores* nutantes v. erecti, breviter pedicellati, ½ unc. longi.

Very nearly allied to the North-African and Abyssinian *S. bipartita*, Desf. (to which the Cape *S. Burchellii* is too nearly allied), but differing in its great size, the less contracted base of the calyx, small fleshy lamina of the petals, and the corona reduced to two prominent fleshy lobes. It is probable that these are all states of one species, of which the present, from the most tropical and humid locality, has much more highly developed vegetative organs and correspondingly reduced reproductive ones. I cannot determine whether it is annual or perennial.

2. CERASTIUM VULGATUM, *L.*, var. *glomeratum*, Thuil. C. viscosum, *Fries.*

Hab. Cameroons Mountains (no elevation given).

The leaves are more uniformly acute than in the common European states. It is also an Abyssinian plant, *C. Simense*, Hochst., in no way differing from the European form.

3. STELLARIA MANNII, *H.f.*, n. sp. Caule procumbente diffuse ramoso tenui glaberrimo, apicibus ramorum et inflorescentia glanduloso-pilosis, foliis petiolatis ovatis acutissimis, floribus laxe paniculatis, sepalis ovato-lanceolatis acuminatis, petalis sepala subæquantibus ad medium 2-fidis, stylis 3, capsula 4-valvi 1-sperma.

Hab. Cameroons Mountains, alt. 7000 feet.

Caules 1-2-pedales, flaccidi, ramis adscendentibus. *Folia* longe petiolata, ⅔–1 unc. longa, læte viridia, tenuiter membranacea, margine subcrispato, petiolo ¼–¾ unc. longo. *Flores* ad apices ramorum laxe paniculati, graciliter pedicellati, ⅓ unc. lati, bracteis lanceolatis acuminatis. *Sepala* viridia, herbacea, carinata. *Petala* tenerrima, lobis falcatis apicibus conniventibus. *Ovarium* parvulum, 5–6-ovulatum. *Capsula* parvula, glaberrima. *Semen* (morbidum ?) magnum, testa papilloso-granulosa.

Very closely allied to the Cingalese *S. drymarioides*, Thw., and Himalayan *S. monosperma*, Ham., but differing from both in the foliage and larger flowers.

4. **Arenaria Africana**, *H.f.*, n. sp. Tota (superne præcipue) glanduloso-pilosula v. pubescens, caulibus gracilibus prostratis, foliis distantibus sessilibus lanceolatis acutissimis membranaceis, floribus ad apices ramorum paucis laxe paniculatis, sepalis oblongis subacutis anguste marginatis, petalis angustis retusis v. breviter 2-lobis, stylis 5, capsula oblonga 5-valvi, seminibus aurantiacis granulatis.

Hab. Cameroons Mountains, alt. 7000–10,000 feet. (Fl. Dec.)

Caules $\frac{1}{4}$–1-pedales, laxe ramosi, debiles, fragiles, internodiis 1–2 unc. longis. *Folia* patentia, plana, pollicaria, basi obtusa, utrinque glanduloso-pilosa. *Panicula* pauciflora, pedicellis $\frac{1}{4}$–$\frac{1}{2}$ unc. longis. *Flores* $\frac{1}{3}$ unc. diam. *Sepala* viridia, planiuscula. *Petala* sepalis longiora, alba, tenuiter membranacea, sensim apicem versus latiora, apice rotundato retuso v. 2-fido. *Stamina* 10, filamentis tenuissimis. *Ovarium* lineari-oblongum. *Capsula* sepalis paulo longiora. *Semina* ad 10–12, compressa, opaca, cotyledonibus incumbentibus.

A flaccid slender species, much resembling some very weak shoots of the North-African *A. procumbens*; but the flowers are white, the leaves are very different, the cotyledons accumbent, and, as far as I can make out, the capsule is only 5-valved. I know of no very nearly allied species. The petals are sometimes as much bifid as in many Stellarias; they vary much, sometimes even in the same flower.

5. **Sagina Abyssinica**, *Hochst.* (*ante*, vi. 6).

Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 9000–11,000 feet. (Fl. Nov.–Jan.)

Plant sometimes forming dense hard tufts with woody roots.

6. **Drynaria cordata**, *Willd.*

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec., Jan.)

8. HYPERICINEÆ.

1. **Hypericum angustifolium**, *Lamk.* (*ante*, vi. 6).

Hab. Fernando Po, alt. 7000–10,000 feet. Cameroons Mountains, alt. 4000–8000 feet. (Fl. Dec.)

The leaves of Cameroons specimens are as narrow as of Abyssinian, and as well as the calyx are copiously glandular, but have few black dots.

9. LINEÆ.

1. **Radiola Millegrana**, *L.*

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Absolutely identical in every particular with the European plant, which ranges from Scandinavia to Spain and from Madeira to Southern Russia, but has not hitherto been found in North Africa*.

10. GERANIACEÆ.

1. GERANIUM EMIRNENSE, *Hils. & Boj. MSS. in Hb. Hook.*
Hab. Fernando Po, alt. 8500 feet.

2. GERANIUM SIMENSE, *Hochst.* (*ante*, vi. 6).
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.–Jan.)

The same as Hochstetter's plant, except in the sepals being rather more gradually acuminated and the stipules rather narrower. It differs from the Fernando Po and Madagascar *G. Emirnense*, Hils. & Boj., with which it is confounded in the Fernando Po florula, in wanting the spreading hairs. In Abyssinia it inhabits the middle region of Mount Silke.

3. GERANIUM FAVOSUM, *Hochst.*
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)—Herbacea, 4-pedalis.

Except in the rather smaller size of all its parts, and the lobing of the leaf hardly being carried below the middle, this is identical with the very remarkable Abyssinian species of Hochstetter. It is readily distinguished by the slender habit, copious spreading glandular hairs in all its parts, membranous foliage with acutely laciniate lobes, very short peduncles—often so short that the pedicels appear in pairs in the axils of the leaves, and the rugose carpels. In Abyssinia it is found at 5500 feet elevation, in the province of Agow.

4. OXALIS CORNICULATA, *L.* (*ante*, vi. 8).
Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

IMPATIENS.

I have here described all the species of this beautiful genus which have been discovered by Mr. Mann in the Islands of Biafra, Cameroons Mountains, and Sierra del Crystal.

1. VERTICILLATÆ. *Folia* verticillata v. opposita. *Flores* subumbellati v. in racemos longe pedunculatos breviter pedicellati.

1. IMPATIENS SAKERIANA, *H.f.*, n. sp. Caule erecto, foliis verticillatis

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* See footnote at p. 181.

graciliter petiolatis oblongo-lanceolatis acuminatis cuspidato-serratis, pedunculis folio longioribus, floribus breviter racemosis, sepalis late ovatis, vexillo galeato, labello infundibuliformi in calcar robustum apice inflatum contracto, alis parvis.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.–Jan.)

Species pulcherrima, elata, 8-pedalis, ramosa?, inferne glabra, apicibus ramorum petiolis pedunculis basi foliisque junioribus subvillosis. *Folia* 1–4 unc. longa, in verticillo 3–6, petiolis ½–3 unc. long., patentia, membranacea, glaberrima v. pilosula, crenato-serrata, crenis apice v. prope apicem setosis. *Pedunculi* validi, valde elongati, rigidi, 4–10-flori. *Bracteæ* ovatæ, acuminatæ, herbaceæ, persistentes. *Pedicelli* ½–1 unc. longi. *Flores* coccinei? *Sepala* bracteis similia, viridia, herbacea. *Vexillum* tumidum, valde concavum, obtusum, dorso apiculatum, lateribus productis. *Labellum* cum calcari ¾ unc. long., calcari in apicem pyriformem 2-lobum tumente. *Alæ* lineares, vexillo vix longiores, porrectæ, flavo et purpureo ut videtur coloratæ. *Capsula* ⅔ unc. longa, ovalis, medio turgida, utrinque attenuata.

Named in compliment to the Rev. Mr. Saker, Mr. Mann's companion in his ascent of the Cameroons Mountains, and to whom he is much indebted for the success of his enterprising journey.

2. UMBELLATÆ. *Folia* alterna. *Flores* ad apicem pedunculi elongati, subumbellati.

2. IMPATIENS FILICORNU, *H. f.* (*ante*, vi. 6).

Hab. Fernando Po, alt. 4000–5000 feet. Sierra del Crystal. (Fl. Dec.)

3. IMPATIENS MACROPTERA, *H. f.*, n. sp. Glaberrima, caule crasso erecto nodoso, foliis apicem versus caulis alternis petiolatis ovatis acuminatis grosse crenatis inter crenas setiferis, pedunculis axillaribus elongatis erectis 2–4-floris, bracteis sepalisque ovatis acutis, pedicellis breviusculis, floribus magnis, vexillo parvo orbiculato purpureo, labello late oblique conico, calcari brevi incurvo, alis maximis pendulis oblongis obtusis.

Hab. Fernando Po, alt. 4500 feet. (Fl. April.)

Herba 2–4-pedalis. *Caulis* nodosus. *Folia* (cum petiolo glaberrimo) 3–4″ longa, superne sub lente fasciculis subcutaneis raphidum notata. *Pedunculi* folia superantes. *Bracteæ* et *sepala* consimilia, ⅕″ longa. *Pedicelli* 1″ longi. *Flores* 2–2½″ longi, albi et virescentes (*ex Mannio*). *Vexillum* ut videtur ex sicco violaceum.

4. IMPATIENS PALPEBRATA, *H. f.*, n. sp. Parvula, pilosula, caule simplici paucifoliato, foliis graciliter petiolatis anguste oblongo-ovatis cordatis grosse crenatis crenis infimis longissime ciliolatis, scapo longissimo tenui apice florifero, bracteis minutis, pedunculis breviusculis, sepalis majusculis, vexillo breviusculo, alis elongatis stipitatis,

labello brevi in calcar crassum basi abrupte incurvum acutum repente contracto.

Hab. Sierra del Crystal. (Fl. July.)

Spithamæa. *Folia* $\frac{3}{4}$–1 unc. longa, membranacea, profunde crenato-lobulata, ciliis basi rigidis fere $\frac{1}{4}$ unc. longis; petiolo laminæ subæquilongo. *Scapus* 3 unc. longus, gracilis, apice 3–5-florus, pedicellis $\frac{1}{4}$ unc. longis. *Flores* $\frac{1}{2}$ unc. diam. *Vexillum* $\frac{1}{6}$ unc. latum, sepalis æquilongum. *Alæ* divaricatæ, $\frac{1}{3}$ unc. longæ, dimidiato-oblongæ, purpureæ. *Labellum* $\frac{1}{4}$ unc. longum, ore oblongo, acuto, purpureo et viridi striato.

3. UNIFLORÆ. *Folia* alterna. *Pedunculi* axillares, sæpissime solitarii v. bini, uniflores.

5. IMPATIENS MANNII, *H. f.* (*ante*, vi. 7).

Hab. Fernando Po, alt. 4000 feet. Cameroons Mountains, alt. 2500–3000 feet. (Fl. April–Dec.)

In exemplaribus e mont. Cameroons, nervi foliorum subtus pedunculique pubescentes evadunt, et vexillum latius.

6. IMPATIENS BICOLOR, *H. f.* (*ante*, vi. 7), *Hook. Bot. Mag.* t. 5366.

Hab. Fernando Po, alt. 4000 feet. Cameroons Mountains, alt. 3500 feet. (Fl. Dec.–Feb.)

7. IMPATIENS BURTONI, *H. f.*, n. sp. Caule gracili erecto superne foliisque junioribus pilis mollibus subvilloso, foliis alternis graciliter petiolatis ovato- v. oblongo-lanceolatis acuminatis crenatis membranaceis utrinque sparse pilosulis, pedunculis solitariis axillaribus 1-floris gracilibus, sepalis lineari-lanceolatis acuminatis, vexillo bilobo dorso carinato piloso cornuto, labello late infundibuliformi, calcari tenui lente curvo, alis amplis.

Hab. Cameroons Mountains, alt. 2500–3000 feet. (Fl. Dec., Jan.)

Herba 2–3-pedalis. *Caulis* inferne glaber, siccitate sulcatus. *Folia* 3–4 unc. long., in petiolum attenuata, sinibus crenarum setulosis. *Pedunculi* petiolis longiores, erecti v. patentes. *Flores* flavi?, 1 unc. longi. *Vexillum* alis dimidio minus, late quadratum. *Calcar* vexillo vix longius, lente curvum. *Alæ* rhombeo-triangulares, patentes, angulis rotundatis. *Capsula* late elliptica, glaberrima.

4. LATERIFLORÆ. *Folia* alterna. *Pedunculi* axillares, solitarii, sæpissime 2–4-flores.

8. IMPATIENS HIANS, *H. f.* (*ante*, vi. 7).

Hab. Fernando Po, alt. 2000 feet.

9. IMPATIENS BUCCINALIS, *H. f.*, n. sp. Glaberrima, caule ramoso, ramis geniculatim flexuosis apices versus foliatis, foliis petiolatis oblongo-lanceolatis acuminatis crenatis inter crenas setiferis, petiolis setis crassis glanduliferis sparsis, racemis brevibus 2–4-floris, bracteis late ovatis mucronatis, pedunculo brevi, pedicellis gracilibus flore

brevioribus, sepalis late ovatis cuspidatis, vexillo cucullato dorso late alato, labello crasso elongato cylindrico in calcar crassum circinatum intus gibbum contracto, alis parvis inclusis.

Hab. St. Thomas's Island, alt. 4000 feet.

Herba frutescens 12–15-pedalis (*G. Mann*), ramis ad axillas foliorum glandula depressa orbiculari auctis. *Folia* 4–6″ long., membranacea, nervis arcuatis, petiolo setis crassis glanduligeris sparsis. *Flores* 2″ longi, 1½″ diametr. (ut videtur ex sicco rubri). *Vexillum* profunde concavum et dorso late alatum. *Labellum* ore acuminato, crassum, curvum, ad apicem in calcar circinatum abrupte attenuatum, latere incurvo ad basin calcaris abrupte gibbo inflato; calcari crassi, brevi, apice obtuso. *Alæ* parvæ, 2-lobæ, obtusæ, vexillo æquilongæ, os labelli non excedentes.

10. IMPATIENS MACKEYANA, *H. f.*, n. sp. Elata, robusta, glaberrima; caule crasso, foliis ad apicem caulis confertis alternis petiolatis elongato-lanceolatis setoso-serratis, pedunculis axillaribus brevibus 2–3-floris, floribus maximis, vexillo amplo latissime ovato, alis stipitatis amplissimis, labello brevi late conico v. scaphæformi in calcar tenue inflexum repente contracto.

Hab. Sierra del Crystal, on rocks. (Fl. July.)

Species omnium fere speciosissima. *Caulis* 1–2-pedalis, succulentus. *Folia* 4–10 unc. longa, petiolis 1–3 unc. longis, sparse glandulosis v. setosis. *Pedunculi* cum pedicellis 1–3 unc. longi; bracteis minutis. *Flores* læte purpurei, 2–3 unc. diametr. *Sepala* ¼–⅓ unc. longa, oblique oblonga, acuminata. *Vexillum* 1 unc. latum, obtusum, membranaceum, multo latius quam longum. *Alæ* 2 unc. longæ, patentes, 2-lobæ, lobo inferiore laterali subrotundato quam terminalis obovatus multo minore. *Labellum* breve, ore oblongo 1 unc. diametr. longiore; calcari ⅓ unc. longo. *Capsula* ⅓ unc. longa, oblique oblonga, utrinque attenuata. *Semina* perplurima, minuta, obovoidea, rufa, papillosa.

11. RUTACEÆ.

Trib. AURANTIACEÆ.

1. CLAUSENA INÆQUALIS, *Benth. in Fl. Nigrit.* 257.

Hab. Cameroons Mountains, alt. 7000–7500 feet. (Fl. Dec.–Feb.) (Tree 10 feet).

Professor Oliver, who has kindly examined these specimens, finds no difference, beyond the more luxuriant habit, between them and others from South Africa, where it abounds from Uitenhage to Macalisburg. He further identifies it with *C. anisata* of Cape Coast, and considers it scarcely distinguishable from *C. Willdenovii* of India, except by the collateral insertion of the ovules.

12. SIMARUBEÆ.

1. **BRUCEA ANTIDYSENTERICA**, *Miller*.
Hab. Cameroons Mountains, alt. 7000–7500 feet. (Fl. Dec.–Feb.)

Mann's plant seems identical with the Abyssinian. It grows 20 feet high.

13. OCHNACEÆ.

1. **GOMPHIA MICRANTHA**, *H. f.* (*ante*, vi. 8).
Hab. Fernando Po, alt. 5000 feet. (Fl. Nov.)

14. ILICINEÆ.

1. **ILEX CAPENSIS**, *Sond. & Harv. Fl. Cap.* i. 473.
Hab. Cameroons Mountains, alt. 4000–7500 feet. (Fl. Feb.)

Apparently a very common South-African plant, found from the vicinity of Cape Town to Macalisburg. It attains 40 feet high on the Cameroons.

15. AMPELIDEÆ.

1. **VITIS (CISSUS) CYPHOPETALA**, *Fres.*; *A. Rich. Fl. Abyss.* i. 110.
Var. *occidentalis*, foliolis glabratis acutius serratis.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.)

Very near indeed to the Abyssinian plant, but differing in the rather narrower, more acuminate leaflets with sharper serratures, and in being everywhere less pubescent; the structure of the remarkable flowers is identical. The leaves show a tendency to become digitate.

16. SAPINDACEÆ.

1. **SCHMIDELIA ABYSSINICA**, *Hochst. in Pl. Schimp.* S. Africana, *DC. ex A. Rich., Flor. Abyss.* i. 102, sed vix.
Hab. Cameroons Mountains, alt. 7000–7500 feet. (Fl. Dec.)

The ripe carpels of the Cameroons specimens are rather larger than those of the Abyssinian (*S. Abyssinica*, Hochst.), and more distinctly pedicellate. Our specimens are from a tree 30–40 feet high. Schimper describes it as "arbor altissima," and says it grows in the mountain-region of Semajata. A. Richard unites the Abyssinian plant with the Oware one of Palisot; but they differ so much in the size of the flowers, that they seem scarcely the same specifically.

17. LEGUMINOSÆ.

1. **ADENOCARPUS MANNII**, *H. f.* Cytisus Mannii (*ante*, vi. 8).
Hab. Fernando Po, alt. 9000 feet. Cameroons Mountains, alt. 7000–12,000 feet. (Fl. Dec.)

The flowers of the Cameroons Mountains' specimens are con-

siderably larger than the Fernando Po ones, and the pods prove it to be a true *Adenocarpus*.

2. TRIFOLIUM SUBROTUNDUM, *Steud. & Hochst.*; *var.* stipulis majoribus (*ante*, vi. 8).

Hab. Fernando Po, alt. 9000 feet. (Fl. Dec.)

3. TRIFOLIUM SIMENSE, *Fresen.* (*ante*, vi. 9).

Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Nov., Dec.)

4. INDIGOFERA ATRICEPS, *Hook.*, n. sp. Fruticulus gracilis, hispido-setulosus, foliis imparipinnatis, foliolis 9–13 obovatis v. obovato-oblongis apiculatis utrinque petiolisque hispidulis, pedunculis axillaribus foliis longioribus racemisque brevibus atro-pilosulis, calycis tubo brevi turbinato lobis longe subulatis, ovario 5–8-spermo, legumine hispido-piloso stylo filiformi persistente terminato.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.–Jan.)

Fruticulus ramosus, 2–3-pedalis, ramis teretiusculis, partibus novellis setis patentibus deciduis glandulosis sparsis, ramulis ultimis pedunculis calycibusque atris. *Folia* $\frac{3}{4}$–$1\frac{1}{2}$ unc. longa, petiolo gracili; foliola petiolulata, plana, enervia, $\frac{1}{3}$–$\frac{1}{2}''$ longa; stipulæ filiformes. *Flores* $\frac{1}{4}$ unc. longi, purpurei, breviter pedicellati, conferti, subsecundi; bracteolæ subulatæ. *Calycis* lobi stamina æquantes. *Vexillum* late oblongum, apice rotundatum, reflexum, dorso hispido-pilosum. *Alæ* spathulatæ, obtusæ, carinam æquantes, apices versus extus hispidulæ. *Antheræ* longe mucronatæ. *Legumen* teretiusculum, $\frac{1}{3}$ unc. long., setulis atris bifurcatis hispidulum, pilisque pallidis glanduliferis patentibus sparsis deciduis onustum. *Ovarium* pilosum, septis spuriis locellatum, 6–8-spermum. *Semina* parva, immatura.

5. DESMODIUM STRANGULATUM, *Wight & Arn.*

Hab. Cameroons Mountains, alt. 2000–7000 feet. (Fl. Jan.)

A variety with obtuse leaves (so far as I can judge without ripe fruit) of the common tropical Indian and African weed, which varies with leaflets acuminate and obtuse.

6. SHUTERIA AFRICANA, *H. f.*, n. sp. Molliter retrorsum sericeo-pilosa, stipulis bracteisque lineari-oblongis scariosis multistriatis, foliolis late ovato-oblongis ovatisve longe apiculatis membranaceis superne pilosis subtus sericeo-pilosis, racemis elongatis, floribus graciliter pedicellatis, calycis tubo cylindraceo-campanulato lobis subulatis duplo longiore, leguminibus lineari-ensiformibus undulatis compressissimis marginatis.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.)

Caulis gracilis, volubilis, 10–12-pedalis. *Petioli* graciles, 2 unc. longi. *Foliola* 2 unc. longa, lateralia basi stipellis filiformibus aucta. *Stipulæ*

⅓ unc. longæ. *Racemi* 3–4 unc. longi, multiflori; bracteæ ¼–⅓ unc., pedicellis longiores. *Flores* ½ unc. long. *Calyx* ebracteolatus, parce pilosus. *Corolla* purpurea. *Vexillum* obovatum, anguste biauriculatum. *Stamen* vexillare, liberum. *Stigma* capitatum. *Legumen* subsericeum, ½–1 unc. longum, ⅙ unc. latum, utrinque oblique acutatum, apice rostratum, 2–4-spermun, intus continuum. *Semina* reniformia, marmorata, ⅛ unc. lata.

This is identical with an Abyssinian species collected by Dr. Roth near Ankobar.

7. DALBERGIA, sp.

Hab. Cameroons Mountains, alt. 5000 feet. (Fl. Dec.)

A tropical, glabrous, and apparently new species, of which I have no fruit. The leaflets are 3–4-jugate, petiolulate, lanceolate, with attenuate retuse apices, coriaceous. Flowers on short, branched, nearly glabrous panicles.

18. ROSACEÆ.

1. RUBUS APETALUS, *Poir.* (*ante*, vi. 9).

Hab. Fernando Po, alt. 7000 feet. Cameroons Mountains, alt. 4000–9000 feet. (Fl. Nov.)

Some of the Cameroons Mountains' specimens are apetalous, like the East African; and Mr. Mann observes that the fruit is eatable.

2. ALCHEMILLA TENUICAULIS, *H. f.*, n. sp. Parvula, laxe molliter patentim villosa, caulibus elongatis prostratis, foliis orbiculari-reniformibus 5–7-lobis, lobis obtusis crenulato-serratis, foliis floralibus cuneatis 3-lobis, calycis lobis brevibus ovatis, acheniis 2–4 glabris.

Hab. Fernando Po, alt. 7500 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Caules 6–12 unc. longi, tenues. *Folia* radicalia conferta, ½–¾ unc. lata, utrinque sericeo-pilosa, fere ad tertiam partem 5–7-loba. *Stipulæ* membranaceæ v. herbaceæ, profunde dentatæ. *Flores* in axillis foliorum floralium, laxe spicatæ, parvæ, sessiles. *Calycis* tubus glabriusculus, lobis parvis ovatis acutis. *Stamina* imperfecta 3 tantum visa. *Achenia* matura 2–4, stipitata, minuta, glabra.

Very similar in many respects to the *A. Capensis*, Th., but smaller in all its parts, with smaller calyx-lobes, and several much smaller achenia. The Abyssinian *A. pedata*, Hochst., has deeper-cleft leaves.

3. PYGEUM AFRICANUM, *H. f.*, n. sp. Glaberrimum, foliis longe petiolatis elliptico-oblongis obtuse acuminatis et serratis, racemis multifloris, calycis 5-lobi tubo lato intus piloso, petalis parvis fimbriatis.

Hab. Cameroons Mountains, alt. 7000–7500 feet. (Fl. Dec., Jan.)

Arbor 30–40-pedalis. *Folia* 4 unc. longa, submembranacea, læte viridia, glaberrima, eglandulosa, reticulatim venosa, petiolo gracili ½ unc. longo.

Stipulæ parvæ, deciduæ. *Racemi* pollicares et ultra, 12–20-flori, patentes. *Pedicelli* patentes v. decurvi, ¼ unc. longi, ebracteati. *Calycis* tubus hemisphærico-campanulatus, lobis brevibus latis obtusis. *Petala* parva, alba. *Stamina* 20–30, filamentis brevibus subulatis. *Antheræ* oblongæ. *Ovarium* oblique ovoideum, in stylum crassum brevem subangustatum, stigmate magno, obliquo.

Apparently identical with a species gathered in tropical Eastern Africa by Dr. Kirk (Livingstone's Expedition), at an elevation of 3000 feet, at the foot of Mount Tshiradzuri and near Mungazi, of which I have fruit only. The latter is a much depressed sphere, near ½ inch in longest diameter, coriaceous and 1-seeded. The leaves are rather more deeply toothed in Mann's plant; but that is a most variable character amongst its allies.

19. CRASSULACEÆ.

1. TILLÆA ALSINOIDES, *H. f.*, n. sp. Herba foliosa, ramosa, glaberrima, annua ?; foliis breviter petiolatis ovato-oblongis subacutis integerrimis subenerviis, petiolis basi in vaginam brevem ciliatam connatis, floribus axillaribus solitariis graciliter pedicellatis, calycis laciniis planiusculis acutis petala consimilia subæquantibus, squamulis hypogynis 0, capsula polysperma.

Hab. Fernando Po, alt. 7500 feet.

Herba habitu *Alsines mediæ*. *Caules* graciles, ramosi, ad nodos radicantes. *Folia* ⅓ unc. longa, obscure 3-nervia, crassiuscula. *Pedunculi* foliis longiores v. breviores. *Flores* albi, ⅓ unc. diametr. *Capsulæ* membranaceæ, sepalis æquilongæ. *Semina* oblonga, pallida.

This species has been gathered near Ankobar in Abyssinia by Dr. Roth.

2. TILLÆA PHARNACEOIDES, *Hochst. Pl. Abyss.* i. 104. Combesia Abyssinica, *A. Rich. Fl. Abyss.* i. 307. Disporocarpa pharnaceoides, *C. A. Mey.*

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.)

Also an Abyssinian and N.W. Indian plant.

3. TILLÆA PENTANDRA, *Royle.*

Hab. Cameroons Mountains, alt. 8000 feet. (Fl. Nov.)

A Himalayan and Nilgherrie Mountains' plant; also found by Roth and Parkyns in Abyssinia.

4. UMBILICUS PENDULINUS, *DC.*

Hab. Cameroons Mountains, alt. 7000–10,000 feet. (Fl. Nov.)

Apparently the same as the European plant, but rather more fleshy in habit, of a deeper green colour, and with the bracts often but not always, foliaceous, and varying greatly in size and in form from linear to oblong-spathulate. A. Richard's Abyssinian *U. botryoides* is the same plant. The range of *U. pendulinus* is from Britain to Mogadore in N.W. Africa, and from Madeira and the Canary Islands, throughout the Mediterranean Sea to the Greek Archipelago, and Abyssinia.

5. CRASSULA (EUCRASSULA, *Harv. Fl. Cap.*) MANNII, *H.f.* Herbacea, caule brevi crasso robusto simplici basi glabro superne minute papilloso, foliis oblongo- v. cordato- v. lineari-lanceolatis in vaginam elongatam connatis ovato-lanceolatis margine papillis fimbrillatis, cymis ramosissimis densifloris, floribus parvis glaberrimis breviter pedicellatis, sepalis oblongo-ovatis obtusis, petalis oblongis obtusis eglandulosis basi subconnatis sepalis vix duplo longioribus, glandulis cuneato-quadratis.

Hab. Cameroons Mountains, alt. 6000–10,000 feet. (Fl. Dec.)

Herba 6–18 unc. alta, robusta, simplex, caule crassitie pennæ olorinæ et ultra, teres, foliosa. *Folia* valde varia, 1–4 unc. longa, interdum late ovato-subcordata, glaberrima, margine tenuiter fimbrillato excepto. *Cymæ* dense congestæ, in corymbum amplum compositum 3 unc. latum dispositæ. *Bracteæ* foliaceæ, sensim minores. *Flores* sub $\frac{1}{6}$ unc. diam.

Very nearly allied to *C. Abyssinica*, A. Richard; but the papillæ on the upper part of the plant are much shorter, the leaves less acute, the flowers considerably smaller, and both sepals and petals shorter, broader, and blunter.

6. KALANCHOË ÆGYPTIACA, *DC.* Glaberrima, foliis obovato-oblongis apice rotundatis in petiolum attenuatis grosse crenatis, paniculis amplis umbellatim cymosis multifloris, floribus $\frac{1}{3}$ unc. longis, sepalis lanceolatis acuminatis, corolla calyce triplo longiore tubo 4-gono urceolato ore angusto lobis oblongis acuminatis.

Hab. Cameroons Mountains, alt. 3000–7000 feet. (Fl. Dec., Jan.)

Herba elata, 4–6-pedalis, glaberrima. *Caulis* teres, superne trichotome ramosus, floribundus. *Folia* 3–4 unc. longa, in petiolum 1–1$\frac{1}{2}$ unc. long. attenuata, grosse crenata, siccitate venosa. *Cymæ* valde ramosæ, subumbellatæ, pedicellis gracilibus, bracteis bracteolisque anguste lanceolatis v. setaceis. *Flores* ut videtur aurantiaci. *Stamina* brevia. *Glandulæ* hypogynæ lineares. *Folliculi* membranacei, longe attenuati. *Semina* minuta, oblonga, flava.

So very nearly allied to *K. Ægyptiaca*, DC. Pl., Grasses, 64, that I hesitate to distinguish it specifically; but the leaves are coarsely crenate, and not toothed as represented in De Candolle's figure. That author, however, describes the leaves as crenate or sometimes entire. I have seen no authentic specimens of *K. Ægyptiaca*, which Forskahl describes (under the name of *Cotyle-*

don deficiens) as a native of Mount Melhan in Arabia (lat. 14° 40′ N., long. 44° E.), and adds that the plant is cultivated in Egypt. De Candolle erroneously considers Mount Melhan to be in Egypt.

Hochstetter and Steudel refer an Abyssinian tomentose *Kalanchoë* (*Schimperiana*, A. Richard, Fl. Abyss. i. 310) to Forskahl's *Cotyledon deficiens*; but no doubt erroneously, as A. Richard suspects.

From the Botanical Magazine figure (tab. 1436, sub *Cotyledone*) of *K. crenata*, Haw. Synops. 109, Mann's plant differs solely in the absence of any hairs, and the apparently darker-coloured flowers, the leaves being identical. *K. crenata* is a native of Western tropical Africa. De Candolle does not describe *K. crenata* as at all hairy.

20. CUCURBITACEÆ.

1. MUKIA, sp.?

Hab. Fernando Po, alt.? Cameroons Mountains, alt. 7000 feet. (Fl. Dec., Jan.) (Male fl. only.)

A similar and probably identical species is found in Abyssinia; it resembles a good deal the common Indian *M. scabrella.*

2. BRYONIA, sp.

Hab. Cameroons Mountains.

A very small-flowered species, not unlike *B. Americana* in habit.

21. UMBELLIFERÆ.

1. HYDROCOTYLE MONTICOLA, *H.f.*, n. sp. Pusilla, glaberrima, caule filiformi elongato, foliis breviuscule petiolatis peltatis orbiculatis basi bilobis 6–9-lobulatis, lobulis crenulatis, pedunculis brevissimis 2–4-floris, mericarpiis 1-costatis dorso acutis, stylis breviusculis.

Hab. Cameroons Mountains, alt. 8500 feet.

Caules tenuissimi, intertexti, 2–4 unc. longi. *Folia* $\frac{1}{6}$–$\frac{1}{3}$ unc. diam., sæpissime peltata, subtus interdum pilosula; petiolo $\frac{1}{8}$–$\frac{1}{2}$ unc. longo. *Pedunculus* $\frac{1}{16}$–$\frac{1}{12}$ unc. longus. *Fructus* $\frac{1}{24}$ unc. latus.

2. HYDROCOTYLE MANNII, *H.f.*, n. sp. Pilosa, caule tenui elongato, foliis modice petiolatis orbiculatis basi ad medium bilobis sinu angustissimo ambitu 7–9-lobis, lobis brevibus obtusis crenatis, pedunculis petiolis subæquilongis hirsutis, capitulis globosis multifloris, fructibus minimis, mericarpiis 1-costatis dorso acutis, stylis elongatis.—An *H. rotundifoliæ* Roxb. var.?

Hab. Fernando Po, alt. 7000 feet.

Caules 6–10 unc. longi, pilosi, novellis hirsutis. *Folia* $\frac{1}{3}$–$\frac{2}{3}$ unc. lata, utrinque longe setuloso-pilosa; petiolo $\frac{1}{2}$–$1\frac{1}{2}$ unc. longo; stipulis latis, membranaceis. *Capitula* $\frac{1}{10}$–$\frac{1}{8}$ unc. diam. *Fructus* $\frac{1}{30}$ unc. latus; stylo subæquilongo.—*H. rotundifoliæ* (Indiæ orientalis) proxima, sed stipulis amplis aliisque notis differt.

3. Sanicula Europæa, *L.* (*ante*, vi. 9).
Hab. Fernando Po, alt. 4000–7500 feet. Cameroons Mountains, alt. 4000–8500 feet. (Fl. Nov.–Feb.)

4. Agrocharis melanantha, *Hochst. in Flora*, 1844, i. 19. A. gracilis, *H.f.* (*ante*, vi. 9).
Hab. Fernando Po, alt. 7000 feet. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec., Jan.)

The Cameroons Mountains' specimens prove that my *A. gracilis* is not even a constant variety of the Abyssinian plant. It attains a height of 4–6 feet.

5. Pimpinella oreophila, *H.f.*, n. sp. (*Gymnosciadium?*, *ante*, vi. 10). Pubescenti-tomentosa, foliis imparipinnatis, foliolis 1–4-jugis subtus pilosis lateralibus rhombeo- v. rotundato-ovatis crenatis terminali cordato, involucro 0, involucelli foliolis paucis filiformibus pedicellos æquantibus, petalis lacinia inflexa, fructu glaberrimo, mericarpiis 9-jugis.
Hab. Fernando Po and Cameroons Mountains, alt. 10,000 feet.
Herba erecta, statura variabilis, 4–10 unc. alta. *Petioli* 2–4 unc. longi. *Foliola* $\frac{1}{3}$-$\frac{1}{2}$ unc. longa, subcoriacea. *Petioli* basi longe vaginantes. *Umbellæ* radii dense v. laxe tomentosi. *Flores* minuti. *Calycis* limbus obsoletus. *Fructus* $\frac{1}{2}$–$1\frac{1}{4}$ lin. longus, glaberrimus, jugis prominulis, vittis inter juga solitariis obscuris.

6. Peucedanum Petitianum, *A. Rich. Fl. Abyss.*
Hab. Fernando Po, alt. 9000–9500 feet. (Fl. Dec.)

The stem is more slender and geniculate, and the rays of the umbel shorter than in Abyssinian specimens.

7. Anthriscus Africanus, *H.f.*, n. sp. Elata, caule basi hispido-pubescente superne divaricatim ramoso, ramis gracillimis, foliis 3-foliolatis rarius pinnatis v. 2-ternatis, foliolis inferiorum petiolulatis late ovato-cordatis grosse inæqualiter dentatis superiorum lineari-lanceolatis serratis petiolis superne retrorsum hispidis, involucris 0, umbellæ radiis 3–5 filiformibus, fructu glaberrimo.
Hab. Cameroons Mountains, alt. 4000–7000 feet. (Fl. Feb.)
Herba 3–4-pedalis; caule gracili tereti sulcato, basi hispidulo, superne glaberrimo, laxe graciliter dichotome ramoso. *Petioli* graciles, petiolulique plus minus retrorsum hispido-pilosi; foliola membranacea, pilosula, 1–2 unc. longa, grosse inæqualiter dentata et sublobata. *Umbellæ* radii 3–4, $1\frac{1}{2}$–2 unc. longi, striati, gracillimi; umbellulæ radii 3–5, fructiferi fere pollicares. *Flores* parvi. *Calycis* limbus obsoletus. *Petala* lacinia brevi inflexa. *Fructus* $\frac{1}{6}$ unc. longus, glaberrimus, anguste ovoideus, mericarpiis teretiusculis glaberrimis, jugis inconspicuis; stylopodiis elongatis; stylis recurvis, filiformibus.

22. ARALIACEÆ.

1. PARATROPIA MANNII, *H.f.* (*ante*, vi. 10).

Hab. Fernando Po, alt. 5000 feet. Cameroons Mountains, alt. 5000–7000 feet. (Fl. Dec.–Feb.)

2. PARATROPIA ELATA, *H. f.*, n. sp. Glaberrima, foliis 5-foliolatis, petiolis petiolulisque gracilibus, foliolis ovato-cordatis acuminatis subserratis nervis conspicuis lucidis, umbellulis 4–6-floris pedunculatis secus ramos simplices elongatos inflorescentiæ racemosis.

Hab. Cameroons Mountains, alt. 7500 feet. (Fl. Feb.)

Arbor 50–60-pedalis, ramis crassis, lignosis. *Petioli* teretes, spithamæi, sulcati; petiolulis 2–3-pollicaribus. *Foliola* 4–7 unc. longa, superne inter nervos reticulatim venosa. *Stipulæ* membranaceæ, subvaginantes, axillares, basi intus ad basin petioli connatæ, coriaceæ. *Inflorescentia* terminalis. Axis crassissimus; bracteis vaginantibus coriaceis pubescenti-tomentosis: rami elongati, curvi, divaricati, 6–8 unc. longi, umbellas pedunculatas racemosim gerentes, rhachi pedunculisque glaberrimis: pedunculi unciales, basi bracteolati, bracteolis linearibus deciduis lanuginosis. *Flores* parvi, pedicellique glaberrimi. *Calyx* turbinatus, limbo truncato. *Petala* 5, ovata, subacuta. *Stamina* 5, petalis æquilonga; antheræ subglobosæ. *Stylus* conicus, apice 4–5-lobus. *Ovarium* 4–5-loculare.

A noble species, very similar to *P. Mannii*, but at once distinguished by the cordate, nerved leaflets and umbellate flowers.

23. LORANTHACEÆ.

1. LORANTHUS (DENDROPHTHOË) OREOPHILUS, *Oliver*, n. sp. Glaber, foliis suboppositis petiolatis ovato-lanceolatis acutis coriaceis, umbellulis axillaribus pedunculatis ∞-floris, floribus pedicellatis bracteola parva oblique cupulari suffultis, corolla basi tumida, filamentis apice in connectivo continuis.—*Oliv. MSS.*

Hab. Cameroons Mountains, alt. 6000–8000 feet. (Fl. Dec.)

Rami 2–3-pedales, robusti. *Folia* interdum alterna v. subverticillata, $2\frac{1}{2}$–4 unc. longa, $\frac{3}{4}$–$1\frac{3}{4}$ lata, petiolo $\frac{1}{3}$–$\frac{1}{2}$ unc. longo. *Pedunculus* 3–10 unc. longus. *Corolla* $\frac{1}{4}$ unc. longa, lobis denique revolutis.—*Oliv.*

24. RUBIACEÆ.

1. BACONIA MONTANA, *H.f.*, n. sp. Glaberrima, foliis ovato- v. obovato-lanceolatis in petiolum angustatis acuminatis, corymbis puberulis, calycis lobis oblongis obtusis.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Frutex 6–8-pedalis. *Rami* teretes. *Folia* 4–6 unc. longa, lucida, petiolis $\frac{1}{2}$–$\frac{3}{4}$ unc. longis; stipulæ in cupulam brevem connatæ, abrupte subulatæ. *Corymbi* breviter pedunculati, subterminales, multiflori, 1–2 unc. lati. *Pedicelli* $\frac{1}{8}$ unc. longi. *Alabastra* $\frac{1}{4}$–$\frac{1}{3}$ unc. longa, glabra. *Calycis* tubus turbinato-campanulatus; limbi lobi subrecurvi,

tubo æquilongi, decidui. *Corollæ* tubus brevis, fauce intus villosa; lobi elongati, imbricati. *Stamina* 4, filamentis brevibus; antheris elongatis, connectivo apice producto. *Stylus* brevis, in stigma elongatum subclavatum angulatum bipartibile desinens. *Ovula* septo peltatim affixa. *Baccæ* parvæ. *Semina* orbiculata, peltata, conchoidea, ventre valde intruso, marginibus cartilagineis. *Albumen* non ruminatum.

Allied to *B. corymbosa*; but the flowers are smaller and the calyx-lobes much longer.

2. Ixora, sp.

Hab. Cameroons Mountains, alt. 5000 feet. (Fl. Dec.)

This genus has not hitherto been found in Abyssinia. The Cameroons species resembles, but is not identical with, a Madagascar one, and is probably a nondescript.

3. Vignaldia occidentalis, *H.f.*, n. sp. Caule basi suffrutescente erecto cum foliis subtus et inflorescentia tomentosis, foliis ovato-lanceolatis superne pubescentibus breviter petiolatis, stipulis in setas 5–7 tomentosas dissectis, cymis corymbosis densifloris, calycis laciniis subulato-lanceolatis tubo corollæ dimidio brevioribus, corollæ tubo elongato pubescente intus subvilloso, lobis linearibus, staminibus exsertis.

Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 7000–9000 feet. (Fl. Nov.–Jan.)

Frutex 3–4-pedalis. *V. Schimperianæ* Abyssiniæ simillima, sed differt lobis calycinis (floriferis et fructiferis) longioribus, tubo gracili corollæ dimidio brevioribus.

4. Anthospermum asperuloides, *H.f.* (*ante*, vi. 11).

Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 12,000 feet. (Fl. Dec., Jan.)

5. Galium rotundifolium, *L.* (*ante*, vi. 11).

Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 7000–12,000 feet. (Fl. Dec., Jan.)

6. Galium Aparine, *L.*, var. *hamatum*, H. f. (*ante*, vi. 11).

Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Dec., Jan.)

25. Dipsaceæ.

1. Scabiosa succisa, *L.*

Hab. Cameroons Mountains, alt. 10,500 feet. (Fl. Jan.)

A very robust form, but not otherwise to be distinguished from the European plant, which ranges from Iceland to Madeira and the Canary Islands, and from Spain to Asia Minor, the Caucasus, and Altai Mountains, but is nowhere found in Northern Africa.

26. COMPOSITÆ.

1. VERNONIA (STROBOCALYX) MYRIANTHA, *H. f.*, n. sp. Arborea, ramulis ultimis foliis subtus inflorescentiaque pubescentibus, foliis 8–10 unc. longis petiolatis lanceolatis eroso-dentatis acuminatis membranaceis, corymbis amplis ramosis polycephalis, capitulis 5-floris apices versus ramorum gracilium corymbi sessilibus subaggregatis, involucri squamis obtusis.

Hab. Fernando Po, alt. 4000–5000 feet. Cameroons Mountains, alt. 3000–7000 feet. (Fl. Dec.–Feb.)

Arbor parva, 20-pedalis. *Rami* crassi, læves. *Folia* superne glabra, subtus pubescentia, demum puberula v. glabrata, nervis utrinque plurimis. *Corymbi* valde ramosi, 6–10 unc. ampli, ramis gracilibus. *Capitula* $\frac{1}{3}$ unc. longa. *Involucri* squamæ glabræ, concavæ, valde coriaceæ, apicibus rotundatis brunneis. *Receptaculum* nudum, papillosum. *Flores* involucro duplo longiores. *Pappi* setæ rigidæ, scaberulæ. *Corolla* glaberrima. *Achenium* apicem versus pilosum.

2. VERNONIA (LEPIDAPLOA) BLUMEOIDES, *H. f.*, n. sp. Herbacea, dense griseo-pubescenti-tomentosa, ramis robustis simplicibus erectis, apice corymboso-ramoso, folioso, foliis 2–3 unc. long. densis erecto-patentibus subsessilibus lanceolatis acutis integerrimis supra scaberulis subtus nervis prominulis, corymbis dense tomentosis ramosis, capitulis $\frac{1}{2}$ unc. longis, involucro campanulato 20-floro, squamis ad 3–5-seriatis linearibus acutis 3-nerviis pubescentibus, pappi setis albis interioribus brevibus, achenio glaberrimo, receptaculo fimbrillifero.

Hab. Cameroons Mountains, alt. 4000–7000 feet. (Fl. Nov.–Jan.)

Herba 2–3-pedalis, subsimplex v. ramosa. *Folia* vix coriacea, $\frac{1}{2}$ unc. lata, siccitate fusco-viridia. *Corymbi* ampli. *Capitula* pedunculata. *Flores* purpurei.

3. VERNONIA? (LEPIDAPLOA) MANNII, *H. f.*, n. sp. Herbacea, elata, ramosa, foliis caulinis e basi ovata profunde cordata amplexicauli elongato-lanceolatis subtus molliter albo-lanuginosis, corymbis multifloris, capitulis $\frac{1}{2}$ unc. longis pedicellatis, involucri campanulati 30-flori squamis 3–4-seriatis lineari-lanceolatis longe ciliatis, pappi setis flavidis scabris 2-seriatis subæqualibus, acheniis glaberrimis, receptaculo lævi.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec., Jan.)

Herba 6–10-pedalis; caule robusto, sulcato, superne pubescente, basi glabrato. *Folium* infimum unicum tantum a Mannio collectum a caulinis valde diversum (an ejusdem speciei?), 2-pedale, membranaceum, spathulato-lanceolatum, in petiolum late sinuato-alatum decurrens, margine denticulato, subtus griseo-tomentosum. *Folia* caulina 6–8 unc. longa, obtusa, denticulata, supra pubescenti-pilosa, subtus dense albo-villosa. *Corymbi* ampli, multiflori. *Flores* purpurei?, glabri, exteriores tenuiores. *Antheræ* exsertæ, bicaudatæ. *Achenium* teretiusculum, nec basi nec apice incrassatum v. dilatatum.

4. VERNONIA (LEPIDAPLOA) CLARENCEANA, *H. f.* (*ante*, vi. 11).
Hab. Fernando Po, alt. 7500–8500 feet. (Fl. Dec.)

5. STENGELIA CALVOANA, *H. f.*, n. sp. Ramulis velutino-pubescentibus, foliis caulinis lanceolatis sessilibus deorsūm longe attenuatis basi auriculato-bilobis membranaceis acute dentatis, corymbis laxe 8–10-floris, capitulis late hemisphærico-campanulatis, involucri foliolis extimis linearibus herbaceis intermediis in laminam maximam oblongam dilatatis intimis coriaceis obtusis, pappi setis multiseriatis compressis pilosis, acheniis teretibus glaberrimis, receptaculo amplo plano lævi.
Hab. Cameroons Mountains, alt. 2500–7000 feet. (Fl. Dec.)
Suffrutex 8–12-pedalis. *Caulis* robustus, ramosus, sulcatus. *Folia* inferiora ignota, caulina 6–10 unc. longa, membranacea, superne glaberrima, subtus ad nervos pubescentia. *Capitula* longe pedunculata, 2 unc. diametr. *Involucri* squamæ crasse coriaceæ v. herbaceæ, basi confluentes, extimæ subsquarrosæ; intermediæ lamina oblonga ½ unc. longa, colorata; intimæ ∞-seriatæ, lineari-oblongæ, concavæ, coriaceæ. *Pappus* subrufescens, nitens. *Corollæ* cyaneæ; tubus gracilis, ore ampliato. *Stamina* exserta, antheris breviter caudatis.

A very fine species, allied to the following and to *S. Adoensis*, Schimp., but differing from both in the sessile cauline leaves with auriculate bases.

6. STENGELIA INSIGNIS, *H. f.*, n. sp. Ramulis robustis pubescentibus et glanduloso-pilosis, foliis graciliter petiolatis lanceolatis acuminatis basi anguste inæqualiter bilobis argute dentatis glaberrimis, corymbis laxe 10–12-floris, capitulis late hemisphærico-campanulatis, cæterum fere *S. Calvoanæ.*
Hab. Cameroons Mountains, alt. 3000–7000 feet. (Fl. Dec.)

A totally distinct species from *S. Calvoana*, differing in the glandular hairs of the stem and corymb, and the slender petioles of the much smaller leaves, which are attenuate at the base and there unequally bilobed. The capitula strongly resemble those of *S. Calvoana*; but the laminæ of the intermediate scales are smaller, shorter, and broader, and the innermost scales are less numerous, and have short, rather membranous appendages.

7. ADENOSTEMMA VISCOSUM, *Forst.* (*ante*, vi. 12).
Hab. Fernando Po, alt. 4000–8000 feet. Cameroons Mountains, alt. 7500 feet. (Fl. Dec.–Feb.)

8. MIKANIA CHENOPODIIFOLIA, *Willd.*
Hab. Cameroons Mountains, alt. 4000–7000 feet. (Fl. Dec.–Feb.)

A common tropical littoral plant on both coasts of Africa and in the Indian Archipelago.

9. MICROGLOSSA DENSIFLORA, *H. f.*, n. sp. Ramis teretibus, petiolis foliisque subtus glanduloso-pubescentibus, foliis 3–4 unc. long. petiolatis ovato-lanceolatis serratis longe acuminatis, corymbis densifloris, involucri campanulati squamis 3–4-seriatis obtusis marginibus ciliatis, floribus radii ligula elongata, pappo albido.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec., Jan.)

Alte scandens. *Caulis* robustus, sulcatus. *Folia* membranacea, superne scaberula, subtus pubescenti-tomentosa; petiolo glanduloso-piloso, subvilloso. *Corymbi* ampli, densiflori. *Involucra* campanulata. *Flores* radii ligula tubo fere æquilonga.

Manifestly a species of *Microglossa*, though differing from the generic character in the much longer ligula of the ray-flowers and white pappus.

10. DICHROCEPHALA LATIFOLIA, *DC.*

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Jan.)

11. DICHROCEPHALA CHRYSANTHEMIFOLIA, *DC.*

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Jan.)

This and the above are very common tropical weeds.

12. DICHROCEPHALA OBLONGA, *H. f.* (*ante*, vi. 12).

Hab. Fernando Po, alt. 10,700 feet. (Fl. Dec.)

Possibly a form of *D. chrysanthemifolia*; but if so, a very peculiar one.

13. BLUMEA ALATA, *DC.*, var. *Natalensis.*

Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec.–Feb.)

A widely distributed and very variable African and Asiatic plant.

14. VERBESINA (PRESTINARIA) MONTICOLA, *H. f.*, n. sp. Glaberrima, caule erecto subsimplici, foliis oppositis tripartitis lobis lanceolatis acuminatis inciso-serratis, capitulis graciliter pedunculatis, fl. radii amplis elongatis ∞-nerviis, acheniis planis lineari-oblongis margine et apice setōsis, aristis 2 brevibus scabridis.

Hab. Cameroons Mountains, alt. 5000–7000 feet. (Fl. Nov.–Jan.)

Herba 1–3-pedalis. *Caulis* nodosus, crassitie pennæ corvinæ, rigidulus. *Folia* subcoriacea, cum petiolo 1½–2 unc. longa, 3-secta, lacinia media sæpe 3-fida. *Pedunculi* unciales et ultra. *Capitula* radio incluso 1½ unc. lata. *Involucrum* late hemisphæricum, squamis extimis linearibus foliaceis, interioribus late oblongis obtusis chartaceis nitidis, intimis sensim in paleas receptaculi lineares concavas floribus æquilongas strictas desinentes. *Fl. radii* fœminei, 1-seriales, ligula aurantiaca, ad 10-nerviis, tubo brevissimo piloso, achenio abortivo, stylo bifido. *Fl. disci* ∞, glaberrimi, achenio corollæ æquilongo, nitido, compressissimo, interdum intus scaberulo, marginibus cartilagineis. *Pappi* aristæ scabræ, setis erectis.

15. TELEKIA AFRICANA, *H.f.*, n. sp. Tota pubescenti-tomentosa, caule apice corymbifero, foliis omnibus petiolatis hastatis obtusis grosse sinuato-crenatis utrinque pubescentibus, involucri squamis linearibus subacutis.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Jan.)

Herba erecta, 3-4-pedalis, caule robusto dense pubescenti-tomentoso. *Folia* alterna, 2–3 unc. longa, ad basin truncatam ¾–1 unc. lata, anguste oblongo-ovata, basi hastata, angulis obtusis v. in lobulum productis. *Corymbi* 5-10-flori. *Capitula* longe pedunculata, 1½ unc. lata. *Involucri* late hemisphærici squamæ pubescentes, herbaceæ. *Fl. radii* abortivi; corolla longe ligulata, aurantiaca, 6–8-nervis, apice integra v. dentata; styli rami subelongati. *Fl. disci* glaberrimi; antheræ breviter caudatæ; achenium glaberrimum, pappo brevi albo coroniformi dentato. *Receptaculum* conicum, squamis linearibus concavis flores amplectentibus.

Of the other three species of this genus, one ranges from Hungary to Southern Russia and the Caucasus, another is confined to Lombardy and the Tyrol, and a third to Asia Minor. The genus is, however, too nearly allied to *Buphthalmum* and *Asteriscus*, which have wider Mediterranean ranges.

16. HELICHRYSUM (XEROCHLÆNA) MANNII, *H. f.* (*ante*, vi. 12).

Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 8000–13,000 feet. (Fl. Dec., Jan.)

Variat capitulis albis et aureis.

17. HELICHRYSUM (XEROCHLÆNA) FŒTIDUM, *Cass.* (*ante*, vi. 13).

Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 4000–10,000 feet.

The Abyssinian *H. glutinosum*, A. Braun, seems to be a form of this species.

18. HELICHRYSUM (ACHYROCLINE) HOCHSTETTERI, *Schultz* (*ante*, vi. 13).

Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 7000–8000 feet.

19. HELICHRYSUM (CHIONOSTEMMA?) CHRYSOCOMA, *Schultz*, var. *angustifolium*, H. f. (*ante*, vi. 13).

Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 7000–11,000 feet. (Fl. Nov.–April.)

20. HELICHRYSUM (CHIONOSTEMMA?) GLOBOSUM, *Schultz* (*ante*, vi. 13).

Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.)

21. Helichrysum (Stœchadina) Biafranum, *H. f.*, n. sp. Caule erecto virgato alato 10-pedali, laxe araneoso, foliis 2–3-unc. lineari-lanceolatis longe acuminatis sessilibus late decurrentibus marginibus recurvis, corymbis amplis ramosis, ramulis tenuibus multifloris, capitulis $\frac{1}{4}$ unc. longis aureis, involucro hemisphærico-campanulato, squamis 4–5-seriatis lineari-oblongis obtusis glaberrimis laxe imbricatis.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Herba elata, ramosa, gracilis, ramis elongatis, floriferis crass. pennæ anatinæ. *Folia* caulina $\frac{1}{3}$–$\frac{1}{2}$ unc. lata, patentia, utrinque laxe araneosa, basi longe et late decurrente, marginibus subintegerrimis, nervis 3 obscuris. *Corymbus* $\frac{1}{2}$-pedalis et ultra, ramis gracilibus sublaxe floriferis, pedicellis lanatis. *Involucri* squamæ ad 40, glaberrimæ, nitidæ, enerves, scariosæ, omnes exacte lineares, subacutæ. *Flores* ad 40. *Receptaculum* alveolatum. *Flores* radii tenues, ♀. *Pappi* pili tenues, scabruli.

22. Gynura vitellina, *Benth.* (*ante*, vi. 14), var. *gracilis*. Caule gracili, foliis angustioribus, capitulis minoribus, involucri squamis paucioribus.

Hab. Fernando Po, alt. 2000–8500 feet. Cameroons Mountains, alt. 7000 feet. (Fl. June–Nov.)

Also an Abyssinian plant.

23. Senecio (Obæjaca) Clarenceanus, *H. f.* (*ante*, vi. 14), var. β. Capitulis majoribus rubris v. albis.

Hab. Fernando Po, alt. 9000 feet. Cameroons Mountains, alt. 7000–11,000 feet. β. Cameroons Mountains, alt. 11,000 feet. (Fl. Dec.)

24. Senecio (Arboreæ) Mannii, *H. f.* (*ante*, vi. 14).

Hab. Fernando Po, alt. 6000 feet. Cameroons Mountains, alt. 2500–7500 feet.

25. Senecio (Discoidei) Bojeri, *DC.*

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Jan.)

Apparently the same as the Madagascar species.

26. Senecio (Ecalyculati) Burtoni, *H. f.*, n. sp. Herbaceus, elatus, caule robusto foliisque albo-araneosis, foliis caulinis lineari-oblongis v. elongato-oblongis acuminatis sessilibus basi decurrenti-auriculatis argute serrulatis, supremis ovato-lanceolatis, corymbis polycephalis glabratis, capitulis graciliter pedunculatis $\frac{3}{4}$ unc. longis, involucri basi tomentosi squamis extimis paucis filiformibus, interioribus anguste linearibus acuminatis late membranaceo-marginatis, ligulis aurantiacis capitulo æquilongis.

Hab. Cameroons Mountains, alt. 8000–12,000 feet. (Fl. Dec., Jan.)

Herba robusta, 3–4-pedalis, ramosa, ramis validis canaliculatis. *Folia* caulina spithamæa et ultra, subtus nivea, laxe lanata, supra araneosa, lineari-oblonga multinervia, obtusa, dentibus marginalibus parvis callosis. *Fl. disci* 30–40, glaberrimi, pappo albo. *Achenia* brevia, costata, glaberrima. *Receptaculum* planiusculum.

A fine species, very nearly allied to the Abyssinian *S. Steudelii*, Hochst.; but it has more minutely toothed and coriaceous leaves: also allied somewhat to *S. alpinus*, *auratus*, &c., but more branched and robust, with sessile, much larger, and differently shaped leaves.

27. LACTUCA (SCARIOLA) CAPENSIS, *Thunb.*, var. *integrifolia*, *DC. Prodr.* vii. 136.

Hab. Cameroons Mountains, alt. 5000–7500 feet. (Fl. Nov., Dec.)

Certainly identical with the South-African plant, which extends throughout the Cape Colony to Natal, ascending in the latter country to 5000 feet.

28. LACTUCA (SCARIOLA) GLANDULIFERA, *H. f.*, n. sp. Glandulosa, hispidula, caulibus angulatim flexuosis, ramis apice divaricatim paniculato-ramosissimis, foliis ultra medium ovato-hastatis acutis denticulatis infra medium in petiolum late alatum basi cordato-bilobum abrupte contractis, pedunculis gracilibus ebracteatis, capitulis 3–4-floris, achenio rostro suo paulo longiore.

Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec.–Feb.)

Herba gracilis, scandens, 8-pedalis, diffuse ramosa, ramis paniculisque setis glandulosis sparsis. *Folia* 1 unc. longa, membranacea, utrinque pilosula. *Capitula* $\frac{1}{2}$ unc. longa, angusta, squamis extimis brevibus, interioribus e basi ovato-lanceolata longe linearibus apice incrassatis. *Pappus* albus. *Achenia* oblonga, acuta, utrinque medio longitudinaliter anguste 3–5-alata, rostro gracili.

Very near to the Abyssinian *L. paradoxa*, Schultz, in every respect but the glandular setæ of the stem and inflorescence.

29. SONCHUS ANGUSTISSIMUS, *H. f.*, n. sp. Caule erecto robusto glauco foliisque glaberrimis, foliis e basi lanceolato-hastata anguste elongatis sensim attenuato-acuminatis margine revolutis retrorsum aculeolatis integris v. lobulis 1–2 lineari-elongatis recurvis auctis, corymbo umbellato, pedunculis nudis, capitulis setosis basi lanatis.

Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Nov.–Jan.)

Herba 4–6-pedalis. *Caulis* erectus, crassit. digiti, striatus, glaucus, simplex. *Folia* spithamæa ad pedalia, vix $\frac{1}{3}$ unc. lata, subcoriacea, enervia, costa subtus prominula, lobis basi elongato-subulatis deflexis. *Corymbi* 8–12-cephali, pedunculis 1–3-cephalis, basi bracteis setaceis, glabris v. sublanatis, 1 unc. diametro. *Involucri* squamæ lineares, obtusæ, basi lana immersæ; exteriores setis subflexuosis hirsutæ. *Achenia* parva, oblonga, utrinque obtusa, lævia, brunnea, compressa, utrinque sub-6-costata, costis obscure transverse undulatis. *Pappus* albus.

A very distinct species, approaching *S. palustris* in habit. It is very nearly allied to a South African plant, of which I have seen only very bad specimens, and which wants the recurved aculei on the edges of the leaf.

30. **Anisoramphus hypochæroides**, *DC.?*
Hab. Cameroons Mountains, alt. 7000–13,500 feet. (Fl. Dec., Jan.)
Herbacea, erecta. *Radix* perpendicularis, fusiformis, perennis. *Folia* radicalia spithamæa, sessilia, a basi ad apicem sensim dilatata, vix 1 unc. lata, membranacea, apice rotundata, eroso-dentata, dentibus retrorsis. *Scapus* pilosulus, simplex v. apicem versus divisus, nudus, folio ovato-lanceolato basi auriculato 2-lobo auctus. *Capitula* ½–¾ unc. lata, longe pedunculata, pedunculo bracteolis paucis filiformibus aucto. *Involucrum* turbinato-campanulatum, foliolis 3–4-seriatis lineari-lanceolatis cum pedunculis viscoso-puberulis. *Receptaculum* fimbrilliferum. *Achenia* pappo pallide fusco æquilonga.

A remarkable plant, of which I have seen no original specimens (from South Africa); it is probably referable to *Hieracium.*

27. CAMPANULACEÆ.

1. **Wahlenbergia polyclada**, *H. f.* (*ante*, vi. 15).
Hab. Fernando Po, alt. 9000 feet. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec., Jan.)

2. **Wahlenbergia arguta**, *H. f.* (*ante*, vi. 15).
Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 7000–9000 feet. (Fl. Dec.)

3. **Cephalostigma Perrotetii**, *A. DC. Prodr.* vii. 420. C. bahiense, *DC. l. c.* 421.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov., Dec.)

Also found on the Niger river by Barter; the Gaboon by Mann; in Senegambia by Perrottet; in South America, at Bahia, by Salzmann and Gardner; and at Tarapoto, Peru, by Spruce. It is clearly allied to the Abyssinian and Indian *C. hirsutum* (*Schimperi*, Hochst.), but differs in the calyx-lobes. Flowers blue.

4. **Lobelia (Tupa) columnaris**, *H. f.* (*ante*, vi. 14).
Hab. Fernando Po. Cameroons Mountains, alt. 7000 feet. (Fl. Dec., Jan.)
Herba 6-pedalis.

5. **Lobelia acutidens**, *H. f.*, n. sp. Glaberrima, caulibus tenuibus prostratis, foliis petiolatis ovatis v. ovato-rotundatis acutis grosse acute

dentatis, pedunculis axillaribus solitariis 1-floris foliis longioribus, calycis setulosi lobis ovato-subulatis corolla triente brevioribus.

Hab. Fernando Po, alt. 9000 feet. (Fl. April.)

L. Schimperi, Hochst., affinis et ejusdem magnitudinis; sed folia latiora, argute dentata; flores minores, et calycis lobi breviores et latiores.

28. ERICEÆ.

1. **LEUCOTHOË ANGUSTIFOLIA,** *β.* pyrifolia, *DC.* (*ante,* vi. 15).

Hab. Fernando Po, alt. 9000 feet. Cameroons Mountains, alt. 4000–8000 feet. (Fl. Dec., Jan.)

2. **BLÆRIA SPICATA,** *Hochst.* (*ante,* vi. 15).

Hab. Fernando Po, alt. 10,700 feet. Cameroons Mountains, alt. 7000–10,000 feet. (Fl. Nov., Dec.)

3. **ERICINELLA MANNII,** *H. f.* (*ante,* vi. 16).

Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 4000–11,000 feet. (Fl. Dec.)

29. PRIMULACEÆ.

ARDISIANDRA, *H. f.*, gen. nov.

Calyx 5-partitus, laciniis triangulari-ovatis membranaceis acuminatis. *Corolla* calyce vix longior, campanulata, profunde 5-loba, tubo brevi, lobis oblongis ciliatis. *Stamina* 5, disco tenui annulari corollæ basi adhærente inserta, inclusa, filamentis brevibus subulatis; antheræ sagittato-ovatæ, acuminatæ. *Ovarium* superum, subglobosum; stylus gracilis, stigmate capitulato; ovula ∞. *Capsula* calyce inclusa, basi cum eo adhærente, depresso-globosa, apice dentibus 5–8 cartilagineis dehiscens. *Semina* ∞, angulata, testa brunnea granulata. *Embryo* transversus.—*Herba* repens, tenella, molliter pilosa, pilis flexuosis, caulibus prostratis. *Folia* sparsa, graciliter petiolata, ovato-rotundata, 3–5-loba v. subangulata, basi profunde cordato-biloba, grosse acute dentata, utrinque pilosula, 1 poll. diametro. *Flores* $\frac{1}{4}$ poll. lati, axillares, solitarii v. 2–3-ni, brevi-pedicellati; pedicellis basi bracteolatis, petiolo brevioribus, gracilibus; bracteolis setaceis. *Calyx* viridis, foliolis marginibus recurvis. *Corolla* alba, membranacea. *Capsula* pilosa, viridis, dentibus albis recurvis.

1. **ARDISIANDRA SIBTHORPIOIDES,** *H. f.* (Plate I.)

Hab. Fernando Po, alt. 7500 feet (fl. May). Cameroons Mountains, alt. 7000 feet (fll. Dec.).

Genus *Androsacæ* affine, differt habitu, antheris acuminatis, stylo elongato, capsula apice tantum dehiscente, et seminibus plurimis.

30. MYRSINEÆ.

1. MÆSA INDICA, *A. DC.* (*ante,* vi. 16).
Hab. Fernando Po, alt. 5000 feet. Cameroons Mountains, alt. 7000 feet. (Fl. and frt. Nov., Dec.)

2. MYRSINE MELANOPHLŒOS, *Br., A. DC. Prodr.* viii. 97. An *M. Simensis,* Hochst., A. DC. *l.c.*?
Hab. Cameroons Mountains, alt. 4000–7500 feet. (Fl. Dec., Jan.)

31. LOGANIACEÆ.

1. ANTHOCLEISTA SCANDENS, *H. f.* (*ante,* vi. 16).
Hab. Fernando Po, alt. 5000 feet. (Fl. Dec.)

2. NUXIA CONGESTA, *Br. D.C. Prodr.* x. 435.
Hab. Cameroons Mountains, alt. 7000–7500 feet. (Fl. Dec., Jan.)
Arbor 30–40-pedalis. *Folia* variant acuta et obtusa in eadem stirpe.

An Abyssinian mountain species.

32. GENTIANEÆ.

1. SEBÆA BRACHYPHYLLA, *Griseb.* (*ante,* vi. 16).
Hab. Fernando Po, alt. 8500–10,000 feet. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Nov., Dec.)

2. SWERTIA PUMILA, *Hochst.* Annua, glaberrima, caule erecto 4-gono angulis subcarinatis, foliis parvis obovatis v. obovato-spathulatis breviter petiolatis integerrimis obtusis, floribus longe pedicellatis 5-meris, sepalis oblongo-spathulatis obtusis corolla dimidio brevioribus, glandulis nectariferis 2 oblongis marginibus laxe setosis.
Hab. Cameroons Mountains, alt. 8000–10,000 feet. (Fl. Jan.)
Herba gracilis, spithamæa ad pedalem, subramosa. *Folia* parva, $\frac{1}{3}$–$\frac{3}{4}$ unc. longa, coriacea, crassiuscula; radicalia pauca. *Flores* subcorymbosi, longe graciliter pedicellati, $\frac{1}{2}$ unc. diametro, flavi. *Sepala* late v. anguste oblonga. *Glandulæ* nectariferæ incrassatæ, tumidæ.

Mann's smaller specimens differ from the Abyssinian in no respect; nor do his larger ones, except in size.

3. SWERTIA MANNII, *H. f.*, n. sp. Gracilis, annua, glaberrima, caule obscure 4-carinato, foliis lineari-lanceolatis obtusiusculis, floribus graciliter pedicellatis 5-meris, sepalis linearibus corolla 4-plo brevioribus, corollæ lobis lineari-oblongis, foveis nectariferis oblongis, marginibus longe fimbriatis.
Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Nov.–Jan.)
Spithamæa. *Folia* $\frac{1}{2}$–1 unc. longa, $\frac{1}{12}$ lata, crassiuscula. *Flores* fere $\frac{1}{2}$ unc. diametro, flavi. *Sepala* lobique corollæ quam præcedentis angustiora.

It is remarkable that this genus should be common in tropical mountainous Africa, but absent in South Africa: several Abyssinian species are described.

4. Swertia Clarenceana, *H. f.* (*ante*, vi. 16).
Hab. Fernando Po, alt. 8500–10,700 feet. Cameroons Mountains, alt. 6000–7000 feet. (Fl. Nov., Dec.)

The Cameroons Mountains specimens are much more slender than the Fernando Po ones, with rather larger flowers and smaller calyces, closely resembling *S. Abyssinica*, but the cauline leaves are not truncate at the base as in that plant. It may prove to be a form of *S. pumila*, which is extremely variable.

33. Borragineæ.

1. Cynoglossum micranthum, *Desf.*, *A. DC. Prodr.* x. 149. An *C. furcatum*, Forsk.?
Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec.)

Apparently the same as the Abyssinian and Indian plant, which is also found at Cape Palmas and in South Africa (*Echinospermum cynoglossoides*, Lehm, Drège in Hb. Hk.).

2. Cynoglossum lancifolium, *H. f.*, n. sp. Caule ramoso cum foliis hispido-pilosis, foliis caulinis late oblongo- v. ovato-lanceolatis valde acuminatis basi in petiolum angustatis superne pilis basi albo-pustulatis, racemis basi bracteatis, pedicellis hispido-tomentosis, florentibus floribus longioribus, fructiferis elongatis decurvis, floribus majusculis, calycis lobis breviter ovatis subacutis corolla multo brevioribus, corollæ lobis obtusis appendicibus bilobis glandulosis, acheniis depressis ambitu breviter glochidiatis.
Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec.)
Herba 3–4-pedalis. *Folia* caulina 3–4 unc. longa, 2–2$\frac{1}{2}$ unc. lata, nervis subparallelis. *Racemi* elongati. *Flores* cærulei, $\frac{1}{3}$–$\frac{1}{2}$ unc. diametro. *Pedunculi* fructiferi fere unciales. *Achenia* subsolitaria, late ovato-orbiculata, ambitu glochidiata, glochidiis brevibus validis multiseriatis, facie superiore lævi leviter rugosa, inferiore glochidiata, cicatrice triangulari.

Allied to the Abyssinian *L. acutifolium*, Steud.; but the leaves are more lanceolate, long-acuminate, and the whole plant more hispid.

3. Myosotis stricta, *Link.* M. hispida, *Schlecht.*
Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 8000–10,000 feet. (Fl. Dec.)

34. Scrophularineæ.

1. Limosella aquatica, *L.*, var. *tenuifolia* (*ante*, vi. 19).
Hab. Fernando Po, alt. 9000–10,000 feet. (Fl. Dec.)

2. VERONICA (VERONICASTRUM) MANNII, *H. f.* (*ante*, vi. 19).
Hab. Fernando Po, alt. 10,700 feet. Cameroons Mountains, alt. 7000–10,000 feet. (Fl. Dec.)

3. VERONICA (CHAMÆDRYS) AFRICANA, *H. f.*, n. sp. Pilosa, caule debili prostrato, foliis longe petiolatis ovatis obtusis grosse crenato-serratis, pedunculis folio subæquilongis 2-floris, sepalis oblongis obtusis pilosis capsula plano-compressa 2-loba pilosa longioribus.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)
Herba habitu et facie *V. montanæ.* *Caules* debiles, 6–10 unc. longi, ubique pilosi. *Folia* pollicaria, utrinque pilosa, petiolo $\frac{1}{2}$ unc. longo. *Pedunculi* graciles, axillares. *Pedicelli* filiformes, $\frac{1}{4}$ unc. longi, bracteis linearibus. *Corolla* $\frac{1}{2}$ unc. diam., lobis late oblongis obtusis. *Capsula* calyce inclusa latior quam longa. *Semina* ∞, parva, oblonga, compressa, pallida, testa granulata. *Stylus* capsulæ æquilongus.

A very European form, and similar to *V. montana*, from which it differs in the smaller, more turgid capsules. It is also closely allied to *V. Petitiana* and *Abyssinica*, both of Abyssinia, which have shorter petioles, and leaves abrupt or cordate at the base.

4. SIBTHORPIA EUROPÆA, *L.*, var. *Africana.* Flore purpureo.
Hab. Fernando Po, alt. 7500 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

The European *Sibthorpia* has flowers part rose-coloured and part yellow; the var. *Africana* is stated to be yellow-flowered; but Mr. Mann describes those of his plant as purple. The species ranges from England to the Azores and Balearic Islands, Madeira, Peru, and Mexico.

5. CELSIA DENSIFOLIA, *H. f.*, n. sp. Caule erecto foliisque subtus pubescenti-tomentosis, foliis confertis breviter petiolatis anguste oblongo-lanceolatis crenulatis subacutis superne puberulis, racemo simplici stricto elongato multifloro glanduloso-pubescente, bracteis ovatis acuminatis denticulatis pedunculos fructiferos subæquantibus, calycis lobis lanceolatis acuminatis capsula brevioribus.
Hab. Fernando Po, alt. 8500 feet. (Fl. April.)
Caulis basi ramosus, ramis strictis subrobustis. *Folia* patentia v. reflexa, subimbricata, 2 unc. longa, superiora sensim breviora et magis ovata, supra reticulatim venosa. *Racemus* 1–2-pedalis, strictus, simplex. *Pedunculi* floriferi $\frac{1}{4}$ unc., fructiferi $\frac{1}{2}$ unc. longi, patentes, robusti. *Calycis* laciniæ $\frac{1}{4}$ unc. longæ. *Corolla* $\frac{1}{2}$–$\frac{2}{3}$ unc. diametro. *Filamenta* omnia villosa, loculis antherarum majorum breviter decurrentibus. *Capsula* ovoidea, ^{1} unc. longa. *Semina* minuta, pallida, profunde sulcata.

6. Alectra Senegalensis, *Benth. in A. DC. Prodr.* x. 339.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Apparently the same as the Senegambian plant.

7. Bartsia Abyssinica, *Hochst., Benth. in A. DC. Prodr.* x. 545.
Hab. Cameroons Mountains, alt. 7000–9000 feet. (Fl. Nov., Dec.)

Quite the same as the Abyssinian plant, in habit, flowers, and foliage. The capsules are linear-oblong, and pubescent, but vary greatly in shape, sometimes broadly oblong.

8. Sopubia trifida, *Ham.*, var. β. *Madagascariensis,* Benth.? in A. DC. Prodr. x. 522.
Hab. Cameroons Mountains, alt. 6000–7000 feet. (Fl. Dec.)

Very similar to the Madagascar species, as also to the *S. Dregeana* of South Africa, *ramosa* of Abyssinia, and *filiformis* of Guinea, which may all belong to one species. It is, however, of a shorter and more robust habit than any of them—a difference possibly due to locality.

35. Solaneæ.

1. Solanum nigrum, *L.* Forma robusta, caule flexuoso tenuiter alato, floribus majusculis.
Hab. Cameroons Mountains, alt. 7000–10,000 feet. (Fl. Dec., Jan.)

2. Solanum Indicum, *L.*
Hab. Fernando Po, alt. 6000 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.–Jan.)

The *S. Adoense*, Hochst., of Abyssinia, seems to be the same plant.

3. Discopodium penninervium, *Hochst., A. DC. Prodr.* xiii. 478.
Hab. Fernando Po, alt. 4000 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.–Feb.)

An Abyssinian mountain plant.

36. Lentibularineæ.

1. Utricularia orbiculata, *Wall.* (*ante,* iii. 187).
Hab. Cameroons Mountains, alt. 5000 feet. (Fl. Nov.)

Professor Oliver, who has examined this (and the following) for me, pronounces it to be absolutely identical with the Indian species (which ranges from Nepal and the Khasia Mountains to Ceylon and Malacca), even to the structure of the glochidiate seeds.

2. Utricularia, sp. Without flower.
Hab. Cameroons Mountains, alt. 4000–6000 feet. (Fl. Nov.)

A small, slender species, 2–5 inches long, with linear spathulate leaves 1½–2 inches long, and emitting distinct utriculiferous fibres from the root. Scape 1–2-flowered. Calyx-lobes very unequal: lower smaller, oblong-ovate, emarginate; upper ovate-lanceolate, rather obtuse.—D. O.

37. LABIATÆ.

1. PLECTRANTHUS (COLEOIDES) GLANDULOSUS, *H. f.* (*ante*, vi. 17).
Hab. Fernando Po and Cameroons Mountains, alt. 7000 feet. (Fl. Dec.–April.)

2. PLECTRANTHUS (GERMANEA) INSIGNIS, *H. f.*, n. sp. Elatus, ramosus, superne glanduloso-tomentosus, foliis amplis oblongo-lanceolatis membranaceis grosse dentatis, paniculis amplis, corollæ flavæ tubo basi gibbo, calyce post anthesin valde aucto.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)
Herba 10–15-pedalis, aspectu *Salviæ* giganteæ. *Folia* pedalia, glabrata, superne secus nervos pubescentia, petiolo 1 unc. longo. *Paniculæ* late diffuse ramosæ, 2-pedales, ramis glacilibus glanduloso-pilosis et tomentosis. *Verticillastri* laxi. *Pedicelli* ¼–¾ unc. longi. *Flores* magni. *Calyx florifer* parvus, tubo brevi cylindrico, lobis subulatis recurvis. *Corolla*, ut videtur ex exemplaribus siccis, aurea, ½–¾ unc. longa, tubo basi contracto gibbo repente ampliato, labiis amplis. *Calyx fructifer* fere uncialis, glanduloso-pubescens, cylindricus, lente curvus, labio superiore ovato acuto marginibus recurvis; inferiore 4-fido, lobis lateralibus brevibus late ovato-subulatis, intermediis longe subulatis lente incurvis. *Nuces* magnæ, compressæ, late ovoideæ, glaberrimæ, læves.

A noble species, remarkable for its great size, Salvoid aspect, and golden flowers.

3. PLECTRANTHUS (ISODON) RAMOSISSIMUS, *H. f.* (*ante*, vi. 17).
Hab. Fernando Po, alt. 5000 feet. Cameroons Mountains, alt. 7000 feet.

4. PLECTRANTHUS (HETEROCALYX) DECUMBENS, *H. f.*, n. sp. Humilis, caule basi decumbente pubescenti-piloso, foliis ⅓ unc. longis petiolatis late ovatis obtusis grosse crenatis, racemo glanduloso-pubescente elongato simplici multifloro, verticillastris 8–10-floris, floribus breviter pedicellatis, calycibus parvis fructiferis hiantibus 2-lobis, pedicellis decurvis, corolla defracta calyce multo longiore.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.)
Herba 1–2-pedalis, glanduloso-punctata, caule glanduloso-piloso. *Folia* subcoriacea, petiolo lamina breviore utrinque laxe piloso. *Racemi* 3–4 unc. longi, simplices, striati. *Verticillastri* subconferti, pedicellis ⅙ unc. longis, floriferis patentibus, fructiferis decurvis. *Calyx* fructifer,

parvus, tubo pubescente hemisphærico, limbi lobo superiore lato ovato obtuso recurvo, lateralibus parvis porrectis, inferiore adscendente oblongo obtuso superiori æquilongo apice retuso. *Corolla* $\frac{1}{3}$ unc. longa, puberula, tubo brevi basi modice defracto, lobo superiore brevi, inferiore elongato anguste cymbiformi punctato. *Stamina* libera.

A small species, closely allied to *P. Palisoti*, but much smaller, the flowers more numerous, the lateral calyx-lobes larger, the lower one not biaristate, and the corolla is very many times the length of the calyx.

5. Coleus (Aromaria) glandulosus, *H. f.*, n. sp. 2–3-pedalis, laxe glanduloso-pilosus, foliis subsessilibus $1\frac{1}{2}$–2 unc. longis ovatis subacutis grosse serratis, racemis simplicibus elongatis, verticillastris remotis dense 8–10-floris, floribus breviter pedicellatis, calycibus fructiferis pendulis, corollæ tubo gracili modice defracto limbo subæqualiter bilabiato longiore.

Hab. Cameroons Mountains, alt. 2500–7000 feet. (Fl. Nov., Dec.)

Caulis gracilis, laxe ramosus, pilis mollibus laxis. *Folia* nunc sessilia, nunc breviter petiolata, utrinque pilosa. *Racemi* floriferi 2–3-, fructiferi 8–10-pollicares, graciles, erecti. *Calyx* fructiferus clausus, deflexus, intus nudus, $\frac{1}{4}$ unc. longus, labio superiore lente recurvo ovato acuminato, inferiore 3-fido, dentibus subulatis. *Corolla* $\frac{1}{4}$–$\frac{1}{3}$ unc. longa. *Filamenta* in tubum connata.

I have a bad specimen of apparently the same plant collected in Abyssinia by Parkyns.

6. Coleus (Solenostemon) tenuicaulis, *H. f.*, n. sp. 6–12 unc. altus, laxe molliter glanduloso-pilosus, caule erecto ramoso, ramis gracilibus, foliis $\frac{1}{4}$–$\frac{2}{3}$ unc. longis petiolatis ovatis serratis, racemis elongatis compositis puberulis, pedicellis gracilibus racemoso-3–5-floris floribusque glanduloso-puberulis, calycibus minutis, fructiferis hemisphæricis oblique 5-fidis lobis subulatis, superiore recurvo, corollæ tubo brevi defracto, labio superiore brevi, inferiore elongato cymbiformi.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Statura valde variabilis, 2–12 unc., tenuis, annua. *Petioli* folio multo breviores. *Folia* utrinque subscabrulo-pilosa. *Racemi* interdum 8 unc. longi, laxe ramosi. *Calyx* fructifer $\frac{1}{8}$ unc. longus, lente curvus, subhorizontalis, fauce glaberrima. *Corolla* $\frac{1}{3}$ unc. longa, glabrata. *Filamenta* ad medium monadelpha.

7. Coleus (Solenostemon) Mannii, *H. f.*, n. sp. Glaberrimus nisi racemus puberulus, 2–3-pedalis, caule crasso 4-gono, foliis 1–$1\frac{1}{2}$ unc. longis petiolatis ovatis v. ovato-lanceolatis acutis grosse crenatis crassiusculis, racemo stricto erecto simplici, verticillastris 15-floris, pedicellis in phalanges 2 oppositas aggregatis gracilibus, calyce parvo, bi-

labiato hiante, corollæ tubo brevi defracto, labio superiore brevissimo, inferiore elongato cymbiformi.

Hab. Cameroons Mountains, alt. 5000–6000 feet. (Fl. Nov.)

Caulis robustus, glaberrimus, crassitie pennæ anatinæ, 4-gonus, internodiis brevibus. *Folia* purpureo variegata, lamina basi in petiolum brevem angustata. *Racemi* 4 unc. longi, stricti, graciles, pedicellis patentibus $\frac{1}{4}$–$\frac{1}{3}$ unc. longis. *Calyx* glanduloso-puberulus, lobo superiore recurvo obtuso, lateralibus minutis, inferiore superiorem æquante apice bifido; fauce glaberrima. *Corolla* $\frac{1}{3}$ unc. longa, glabra. *Filamenta* ad medium monadelpha.

The calyx of this plant is of the same form as that of *Plectranthus decumbens*, of which it is a near ally, but the monadelphous stamens remove it to *Coleus*.

8. Pycnostachys Abyssinica, *Fresen.* (*ante*, vi. 17).

Hab. Fernando Po, alt. 7000 feet. Cameroons Mountains, alt. 6000 feet. (Fl. Dec.)

Specimens from the Cameroons Mountains are more glabrous than those from Fernando Po, in this respect approaching the Madagascar *P. cœrulea* and the S.-African *P. reticulata.* All may be forms of one.

9. Micromeria punctata, *Br.*, *Benth. in DC. Prodr.* xii. 230.

Hab. Cameroons Mountains, alt. 7000–10,000 feet. (Fl. Dec., Jan.)

Certainly the same as the Abyssinian plant, and possibly a form of a South-European one.

10. Calamintha Simensis, *Benth.* (*ante*, vi. 18).

Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 7000–10,500 feet. (Fl. Dec.)

11. Nepeta (Pycnonepeta) robusta, *H.f.*, n. sp. Erecta, robusta, ramosa, pubescenti-hispidula, foliis breviter petiolatis ovatis obtusis grosse serratis coriaceis reticulatis, verticillastris in spicas densas cylindricas terminales dispositis, bracteis lanceolato-subulatis, calycem rectum tubulosum æquantibus, corollæ tubo exserto.

Hab. Cameroons Mountains, alt. 6000–8000 feet. (Fl. Nov., Dec.)

Herba 3–4-pedalis, caule valido, ramis crassitie pennæ anserinæ, pilis patulis subhispidis hirsuta. *Folia* 1–1$\frac{1}{2}$ unc. longa, rigidula, utrinque rugosa, supra glabra, subtus pilosa. *Cymarum* spicæ 1 unc. longæ, obtusæ, densifloræ. *Flores* breviter graciliter pedicellati, flavi?. *Calyx* $\frac{1}{6}$–$\frac{1}{4}$ unc. longus, 15-nervius, pilosus, dentibus subulatis. *Corolla* tubo pubescente exserto, lobis oblongis obtusis.

Closely allied to the Abyssinian *N. ballotifolia*, Hochst., which has broader bracts and much larger flowers.

12. STACHYS ACULEOLATA, *H.f.* (*ante*, vi. 18).
Hab. Fernando Po, alt. 9000 feet. (Fl. Dec.)

13. LEUCAS (HEMISTOMA) DEFLEXA, *H.f.*, n. sp. Herbacea, ramosa, elata, cano pubescens, foliis lanceolatis dentato-serratis, verticillastris densifloris globosis, calycibus hispidis membranaceis ore repente deflexo dentibus 8–10 brevibus late ovatis setaceis.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.–Feb.)
Herba 4–5-pedalis, caule robusto. *Folia* petiolata, 2–3 unc. longa, membranacea, basi attenuata. *Verticillastri* $\frac{3}{4}$–1 unc. diametro. *Bracteæ* calyci æquilongæ, rigidæ, setaceæ, ciliatæ. *Corolla* parva, galea villosa.

Allied to *L. urticæfolia* of Abyssinia, Arabia, and India, but differing remarkably in the foliage, and in the deflexed mouth of the calyx.

14. LEUCAS (LOXOSTOMA) OLIGOCEPHALA, *H.f.*, n. sp. Herbacea, pubescenti-pilosa, caulibus ascendentibus gracilibus simplicibus, foliis parvis oblongo-lanceolatis obtusis grosse pauciserratis, verticillastris globosis subsolitariis, terminalibus longe pedunculatis, bracteis setaceis calycis dimidium æquantibus.
Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Nov.–Jan.)
Herba rigidula, 1–2-pedalis, ubique pilis patentibus v. deflexis subtomentosa. *Caules* subsimplices v. ramis paucis elongatis. *Folia* vix petiolata, $\frac{1}{2}$ unc. longa, subcoriacea, subtus nervis prominentibus, utrinque pilosa. *Verticillastri* foliis 2 brevibus involucrati, $\frac{1}{2}$–$\frac{3}{4}$ unc. diametro, densiflores. *Bracteæ* subulatæ, rigidæ, ciliatæ. *Calyx* tubulosus, incurvus, 2-labiatus, hirsutus, dentibus longe subulatis. *Corolla* parva, albo villosa.

A very distinct species, clearly belonging to Bentham's previously monotypic section *Loxostoma.*

38. PLANTAGINEÆ.

1. PLANTAGO PALMATA, *H.f.* (*ante*, vi. 19).
Hab. Fernando Po, alt. 7500–8000 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

39. POLYGONEÆ.

1. RUMEX ABYSSINICUS, *Jacq.* (*Meisn. in DC. Prodr.* xiv. 68), var. Foliis subtus pilosiusculis.

Altogether the same as the Abyssinian plant, except that there are more scattered hairs on the under side of the leaf. The species is a native also of Bourbon, and of cornfields in Eastern tropical Africa (*Kirk*). Mann states that it attains a height of 8 feet. According to a note on Roth's Abyssinian specimen, the root is

tuberous, and its juice is mixed with butter to give it a brick-red colour.

2. RUMEX OBTUSIFOLIUS, *L.*, var. *Steudelii*. (R. Steudelianus, *Meisn. in A. DC. Prodr.* xiv. 56. R. Nepalensis, *Spreng.*, *Meisn. l. c.* 55. R. hamatus, *Trev.*, *Meisn. l. c.* 56.) Foliis lanceolatis, acuminatis basi angulatis, calycibus valvulis ecallosis setis utrinque 6–10 hamatis.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov., Dec.)

A very common tropical and intertropical form of the common *R. obtusifolius*, found abundantly in Abyssinia, South Africa, throughout the hilly parts of the East Indies, &c. It has very many names in systematic works. A. Richard, in his Abyssinian Flora, remarks that the leaves vary from attenuate to cordate at the base. In our specimen the upper are very acute.

3. POLYGONUM NEPALENSE, *Meisn.*, *A. DC. Prodr.* xiv. 128.
Hab. Fernando Po, alt. 7500 feet.

A common Indian and Abyssinian plant.

40. AMARANTHACEÆ.

1. ACHYRANTHES ARGENTEA, *L.*
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec., Jan.)

2. CYATHULA CYLINDRICA, *Moq.-Tand. in A. DC. Prodr.* xv. pl. 2, var. *Schimperiana*. C. Schimperiana, *Moq. l. c.* Foliis lanceolatis
Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.–Feb.)

The original or short-leaved form of this same plant occurs in Madagascar, South Africa, and in East tropical Africa (Manganja range, Meller in Livingstone's Cape), but not in Abyssinia, where the form *Schimperiana* only occurs.

41. THYMELEÆ.

1. LASIOSIPHON GLAUCUS, *Fresen.*, *Meisn. in DC. Prodr.* xiv. 593.
Hab. Cameroons Mountains, alt. 7000–7500 feet. (Fl. Dec., Jan.)

Mann's plant has rather longer, narrow lobes to the perianth, than an Abyssinian specimen of what we take to be this plant (collected by Mr. Plowden), of which we have no authentic specimens.

2. PEDDIEA PARVIFLORA, *H. f.* (*ante*, vi. 20).
Hab. Fernando Po, alt. 5000 feet. (Fl. Nov.)

42. SANTALACEÆ.

1. THESIUM TENUISSIMUM, *H. f.* (*ante*, vi. 19).
Hab. Fernando Po, alt. 9000 feet. Cameroons Mountains, alt. 8000–9000 feet. (Fl. Nov.–Jan.)

43. EUPHORBIACEÆ.

1. EUPHORBIA AMPLA, *H. f.* (*ante*, vi. 20), var. *tenuior*. Ramulis tenuibus, foliis involucralibus minoribus.

Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Nov., Dec.)

The Cameroons specimens are of a slender variety of the Fernando Po species.

2. PHYLLANTHUS, n. sp.?

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.–Feb.)

A common herbaceous erect form of the genus, which I cannot identify, but am unwilling to describe in the present entangled condition of the species hitherto known.

3. CLAOXYLON MANNII, *H. f.* (*ante*, vi. 20).

Hab. Fernando Po, alt. 5000 feet. (Fl. Oct.)

44. URTICEÆ.

1. PARIETARIA MAURITANICA, *L.*, var. *a. erecta*, Wedd. Monogr. 513 (*ante*, vi. 20).

Hab. Fernando Po, alt. 8000 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

The leaves are 3-nerved from the very base; otherwise it more resembles *P. officinalis*.

2. PARIETARIA DEBILIS, *Fort.*, var. *β. diffusa*, Wedd. Monogr. 515.

Hab. Cameroons Mountains; no elevation given; with plants of the temperate region.

This has the fructiferous perigonium of *P. debilis*, but the terminal apiculus to the fruit of *P. Lusitanica*. The species is universally diffused.

3. LAPORTEA (SCLEPSIA) ALATIPES, *H. f.*, n. sp. Herbacea, grosse setigera, foliis ovatis acuminatis grosse dentatis, inflorescentia axillari, pedunculis elongatis, pedicellis fœmineis alatis flabellatim connatis, achenii margine incrassato.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Herba 3-pedalis, setis rigidis ubique horrida. *Folia* 4–5 unc. longa, petiolis gracilibus longiora. *Inflorescentia* ♂ foliis brevior, floribus glomeratis, 4-meris. *Infl.* ♀ foliis longior, ramis paniculatis subsecundis, ramulis divaricatis, pedicellis $\frac{1}{4}$ unc. longis in laminas flabelliformes connatis. *Fl.* ♀ apici pedicelli oblique impositus. *Perigonii* foliola 2, æqualia, oblique ovata, fructu non accrescentia, achenio dimidio breviora. *Achenium* $\frac{1}{10}$ unc. latum, compressum, suborbiculare, stylo brevi filiformi, marginibus late incrassatis, faciebus planis vix granulatis.

Very nearly allied to the Indian *L. terminalis*, but the inflorescence is lateral; and still more near to the American *L. Canadensis*, but the achenia have much broader wings; it differs further from both in the shorter stigma.

4. Elatostemma monticola, *H.f.*, n. sp. 6–8-pollicaris, caule tenui pubescenti-tomentoso, foliis alternis breviter petiolatis oblique obovato-oblongis grosse serrato-dentatis utrinque sparse setulosis, superiore basi acuto, inferiore obtuso, nervis primariis 2–3, stipulis lanceolatis, capitulis ♀ subsessilibus depressis.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Herba tenella. *Folia* 1–1½ unc. longa, membranacea, puberula et setulosa. *Capitula* ♀ ¼–⅓ unc. diametro. *Involucrum* membranaceum, multilobatum, multiflorum, lobis oblongis ciliatis. *Fl.* ♀ sessiles et pedicellati, conferti. *Perianthii* foliola lanceolata, setuloso-ciliata. *Achenium* ellipsoideum.

A very common form of the genus, resembling closely several mountain Indian species.

5. Pilea quadrifolia, *A. Rich.* Dioica, spithamæa, glaberrima v. sparse pilosula, caule erecto ramoso gracili, foliorum paribus æqualibus graciliter petiolatis ½–⅔ unc. longis late ovatis acutis grosse crenato-serratis membranaceis, stipulis amplis late cordato-rotundatis; fl. ♂ in axillis glomerati, ♀ axillis supremis dense paniculatim conferti.—*Wedd. Monogr. Urt.* 199.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Species elegans, gracilis, læte virens. *Petioli* foliis subæquilongi. *Folia* basi 3-nervia. *Stipulæ* ⅙ unc. longæ. *Fl.* ♂ in axillis plurimis caulis dense congesti, majusculi, 3–5-meri, perianthii lobis 1 v. pluribus longe aristatis. *Fl.* ♀ in paniculas breves subterminales foliis 4 supremis involucratas dense aggregati, perpusilli, breviter pedicellati. *Perianthium* foliolum 1 oblongum (cætera in fructu evanida), achenio brevius. *Achenium* minimum, ovatum, compressum, subgranulatum, stigmate infra-apicali.

The female of this plant (from Abyssinia) is well described by Weddell. The male has long stems and uniform leaves throughout the plant; and the female has much shorter stems, with very few leaves, of which the four upper are subterminal and form a whorl, the lower are (by arrest) smaller, all more or less toothed in our specimens, but apparently sometimes quite entire in Abyssinian. A very closely allied, but larger species, with more effuse female panicles in the axils of all the leaves, is sent by Mann, from 4000 feet in Fernando Po.

6. Leianthus Wightii, *Weddell, Monog. Urt.* 280.

Hab. Fernando Po, alt. 7500 feet.

Apparently the same as the Indian species, which is also Abyssinian.

7. Urera?

Hab. Cameroons Mountains, alt. 5000 feet. (Fl. Dec.)

A tropical form of *Urticeæ*, of which there are male flowers only.

45. Piperaceæ.

1. Peperomia Mannii, *H. f.*, n. sp. Glabra, 4–6-pollicaris, caule gracili basi repente, foliis alternis breviter petiolatis ovato-rotundatis obtusis reticulatim nervosis minute ciliolatis, amentis solitariis subterminalibus strictis brevibus gracilibus.

Hab. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec.)

Species parvula, *caule* gracili, subsimplici. *Folia* $\frac{1}{4}$–$\frac{1}{2}$ unc. longa, fere æque lata v. anguste oblonga, subcarnosa, subtus nigro-punctata, margine apicem versus villosulo. *Amenta* gracilia, breviter pedunculata, $\frac{1}{4}$–2 unc. longa, minute nigro punctata; squamæ orbiculatæ, peltatæ. *Stamina* 2, brevia, antheris parvis oblongis. *Stigma* globoso-capitatum.

This approaches closely the Indian *P. Heyneana*, but the leaves are always alternate and the whole plant almost perfectly glabrous. The *P. Abyssinica* is a much more robust and fleshy plant.

2. Peperomia monticola, *H. f.*, n. sp. Glaberrima, spithamæa ad pedalis, caule robusto, foliis alternis petiolatis elliptico-oblongis obtusis basi 3-nerviis carnosis, nervis crassis, amentis pedunculatis elongatis crassiusculis.

Hab. Cameroons Mountains, alt. 8000 feet. (Fl. Jan.)

Caules basi longe repentes, demum erecti, crassitie pennæ corvinæ. *Folia* 1–1$\frac{1}{2}$ unc. longa, elliptico- v. ovato-oblonga, in petiolum $\frac{1}{3}$–$\frac{1}{2}$ unc. longum attenuata. *Amenta* solitaria, terminalia et axillaria, pedunculata, simplicia, crassitie caulis v. tenuiora, 1–2 unc. longa; squamæ orbiculatæ, peltatæ.

A very common West-Indian type of the genus; also closely allied to *P. Courtallensis* β. of Ceylon (Thwaites's Enum. 292). It differs from *P. Vogeliana* in the obtuse leaves.

3. Coccobryon Capense, *Klotzsch.*

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

A South-African species; also found by Mann on the low ground of Fernando Po (alt. 1300 feet) and in St. Thomas's (alt. 4000–7000 feet). Kirk (Livingstone's Expedition) gathered the same plant at Dzomba, alt. 6500 feet.

46. MYRICEÆ.

1. MYRICA SALICIFOLIA, *Hochst., A. Rich. Fl. Abyss.* ii. 277.

Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec., Jan.)

A tree 20–30 feet high, identical with the Abyssinian, which is described as a tall tree with variable foliage, growing in cold mountain districts.

47. CONIFERÆ.

1. PODOCARPUS MANNII, *H. f.*, n. sp. Foliis anguste elongato-lanceolatis 3–5-pollicaribus $\frac{1}{6}$–$\frac{1}{3}$ unc. latis lente falcatis acuminatis mucronatis 1-nerviis utrinque lucidis.

Hab. St. Thomas's Island, summit of the Peak, alt. 7500 feet.

Ramuli tenues, angulati. *Folia* subdisticha, coriacea, nervo latiusculo, petiolo basi semitorto.

The present discovery of Mr. Mann's negatives the observation of Brown, that Coniferous plants are absent in Western tropical Africa; and I may here remark that this indefatigable collector has also added *Laurineæ* to the same flora, an order equally supposed by Brown to be absent in that region of the globe. The present plant approaches so closely to the South-African *Podocarpus falcatus*, Br., that I should not be surprised if it merged into it; but the leaves are much larger, longer, flaccid, and lucid, and there are stomata on both surfaces of the leaf, which (according to Endlicher, Syn. Conif. 218) is not the case with *P. falcatus*. From the Cape *P. elongatus*, Hérit., which small-leaved specimens closely resemble, it differs in the lucid, very large, long, and acuminate leaves.

There is another species of *Podocarpus* in Abyssinia, referred to *P. elongatus* by A. Richard (Fl. Abyss. ii. 278), which is identical in foliage with the Cape plant, but which differs in the fruit being shortly stipitate.

MONOCOTYLEDONES.

48. ORCHIDEÆ.

1. LIPARIS CAPENSIS, *Lindl.* (*Zeyher*, 3887).

Hab. Cameroons Mountains, alt. 6000–7000 feet. (Frt. Dec.)

A small species, in fruit only, but clearly the same as *L. Capensis*.

2. BOLBOPHYLLUM (PTILOGLOSSUM) TENUICAULE, *Lindl. in Journ. Linn. Soc.* vi. 126.

Hab. Fernando Po, alt. 5000 feet.

3. BOLBOPHYLLUM (PTILOGLOSSUM) MANNII, *H. f.* Pseudobulbis teretiusculis elongatis 2-phyllis, foliis 4–6-pollicaribus linearibus, bracteis glumaceis distichis imbricatis, sepalis lanceolato-subulatis,

petalis parvis linearibus labello lineari-oblongo sepalis subæquilongo longe ciliato.

Hab. Cameroons Mountains, alt. 4000–5000 feet. (Fl. Dec.)

Caudex repens. *Pseudobulbi* 3-5 unc. longi, basi $\frac{1}{2}$ unc. lati. *Folia* $\frac{1}{2}$–$\frac{3}{4}$ unc. lata, obtusiuscula. *Scapus* 1–$1\frac{1}{2}$-pedalis, gracilis, erectus, strictus, spathaceo-bracteatus. *Racemus* 4–6-pollicaris. *Bracteæ* oblongæ, acutæ, concavæ, $\frac{1}{3}$ unc. longæ. *Flores* labello excepto glaberrimæ, bracteis paulo breviores. *Labellum* brevissime unguiculatum. *Columnæ* ramis longe setaceis.

4. Bolbophyllum (Ptiloglossum) monticolum, *H. f.*, n. sp. Pseudobulbis oblongis pollicaribus tetragonis 2-phyllis, foliis 2–3-poll. linearibus, bracteis glumaceis distichis imbricatis, sepalis subulato-lanceolatis, labello lineari-oblongo v. subspathulato longe ciliato sepalis subæquilongo.

Hab. Cameroons Mountains, alt. 5000 feet. (Fl. Nov.)

Caudex repens. *Pseudobulbi* verisimiliter tetrapteri. *Folia* $\frac{}{4}$ unc. longa. *Scapus* foliis duplo longior, spathaceo-bracteatus. *Racemus* $1\frac{1}{2}$-poll. *Bracteæ* ovato-oblongæ, acutæ, $\frac{1}{4}$ unc. longæ. *Flores* flavi ?, bracteis paulo breviores, iis *B. Mannii* valde similes, sed minores, labello a basi sensim lente dilatato, petalisque paulo latioribus.

5. Bolbophyllum (Monophylla) aurantiacum, *H. f.*, n. sp. Caudice valido, pseudobulbis brevibus late ovoideis 1-phyllis, folio lineari basi in petiolum teretem complicato, racemo elongato nutante, floribus aurantiacis secundis, bracteis lanceolatis membranaceis ovarium excedentibus, sepalis longe lanceolato-subulatis, petalis oblongis sepalis dimidio brevioribus, labello elongato-trulliformi recurvo glaberrimo petalis paulo longiore.

Hab. Cameroons Mountains, alt. 5000–6000 feet. (Fl. Nov.)

Caudex crassitie pennæ anatinæ. *Pseudobulbi* 1 unc. longi, ovoidei, basi plus minus tumidi, obtusi. *Folium* 4–5 poll. long., $\frac{1}{2}$–$\frac{3}{4}$ lat., obtusum. *Scapus* gracilis, spathaceo-bracteatus. *Racemi* 5–6-pollicares, multiflori. *Flores* fere $\frac{1}{2}$ unc. longi. *Bracteæ* membranaceæ. *Sepala* a basi sensim angustata, longe acuminata. *Labellum* oblongo-lanceolatum, longiuscule stipitatum, eglandulosum, superficie lævi, medio anguste sulcatum. *Columnæ* rami breves, subulati.

6. Bolbophyllum (Diphylla) bifarium, *H. f.*, n. sp. Caudice valido, pseudobulbis elongato-ovoideis pollicaribus tetrapteris 2-phyllis, foliis lineari-oblongis 3-pollicaribus, scapi bracteis imbricatis, racemo disticho, bracteis ovato-lanceolatis acuminatis patentibus flores excedentibus, sepalis e basi ovato-subulatis membranaceis, lateralibus deflexis, petalis parvis late oblongis undulatis, labello minimo crasso recurvo medio excavato apice truncato glanduloso.

Hab. Cameroons Mountains, alt. 5000 feet. (Fl. Nov.)

Caudex crassitie pennæ corvinæ. *Folia* sessilia, ⅓ unc. lata. *Scapus* brevis, bracteis compressis distiche imbricatis acutis tectus. *Racemus* 3–4-pollicaris, rhachi valida angulata. *Bracteæ* fere ½ unc. longæ, membranaceo-glumaceæ. *Flores* purpurei ?, glaberrimi. *Sepalum* superius cucullatum, lateralia planiuscula. *Petala* membranacea. *Labellum* crasse carnosum, columna brevius, brevissime unguiculatum, basi latiusculum, in apicem crassum truncatum attenuatum. *Columna* alata, alis in processus 2 breves subulato-productis.

7. **Bolbophyllum**, sp. ?

Hab. Cameroons Mountains, alt. 5000 feet. (Fruit only.)

Species parvula, *caudice* valido. *Pseudobulbi* breves, oblongi, tetrapteri, 2-phylli. *Folia* 1½ unc. longa, lineari-oblonga, in petiolum contracta. *Scapus* brevis, validus. *Racemus* rhachi compressa v. angulata, robusta. *Bracteæ* parvæ. *Flores* parvi. *Sepala* ovato-subulata. *Petala* parva, linearia. *Labellum* crasse carnosum, recurvum, obtusum, excavatum. *Columna* aptera, ramis 2 subulatis porrectis.

8. **Angræcum arcuatum**, *Lindl.*

Hab. Cameroons Mountains, alt. 4000–6000 feet. (Fl. Nov.)

The same as the Cape of Good Hope species, which ranges from Uitenhage to Natal. Lindley identifies a much larger form, gathered by Mann on the banks of the Nun, with the same.

9. **Angræcum**, sp.

Hab. Cameroons Mountains, alt. 5000 feet. (Fruit only.)

Very similar to, but much smaller than, *A. capitatum*, Lindl. (*ante*, vi. 137).

10. **Polystachya alpina**, *Lindl.* (*ante*, vi. 131).

Hab. Fernando Po, alt. 6000 feet. (Fl. Dec.)

11–15. **Polystachyæ** species 5.

Hab. Cameroons Mountains, alt. 5000–6000 feet.

Of this genus, which abounds in tropical Africa, and of which one species reaches the Albany district of South Africa, there are five Cameroons Mountains species, occurring at elevations between 4000 and 6000 feet.

16. **Calanthe corymbosa**, *Lindl.* (*ante*, vi. 129).

Hab. Fernando Po, alt. 5000 feet. (Fl. Dec.)

17. **Disa alpina**, *H.f.*, n. sp. Caule gracili, foliis elongato-lanceolatis longe acuminatis 3-nerviis, spica densiflora, bracteis subulato-lanceolatis flores subæquantibus, sepalo postico late ovato obtuso calcari decurvo æquilongo, petalis late oblique ovatis obtusis, labello minimo lineari.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.)

Herba gracilis, spithamæa ad pedalis, glaberrima. *Folia* caule paulo breviora, $\frac{1}{6}$–$\frac{1}{2}$ unc. lata, subcoriacea, plana. *Spica* 2–3 unc. longa. *Sepala* et *petala* $\frac{1}{8}$ unc. longa, flava? *Columna* basi latiuscula, glandulosa.

18. Peristylus (Bifolii) tridentatus, *H.f.*, n. sp. Parvulus, foliis 2 orbicularibus ciliatis, scapo aphyllo villoso 3–4-floro, bracteis parvis subulatis, ovario retrorsum piloso, sepalis petalisque apice 3-dentatis, labello amplo dilatato 7-lobo villoso, calcari brevi conico acuto.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.)

Herba 3-pollicaris. *Folia* coriacea, subacuta, ut videtur cellulosa. *Scapus* robustus. *Flores* parvi. *Sepala* et *petala* subæqualia, pubescentia, $\frac{1}{10}$ unc. longa. *Labellum* sepalis longius, disco villoso utrinque lobulo aucto, apicem versus dilatatum 5-lobum, lobis ovatis. *Columna* brevis.

19. Habenaria debilis, *H.f.*, n. sp. Parvula, caule ovariisque glanduloso-pilosis, foliis 1 et 2 lanceolatis acuminatis, racemo 3–10-floro, bracteis ovario brevioribus, floribus parvis, sepalis petalisque late ovato-oblongis obtusis labello petalis subæquilongo 3-lobo, lobis lineari-oblongis obtusis, antheræ loculis contiguis, calcari recto ovario breviore.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Caulis 4–6-pollicaris, gracilis. *Folia* caule paulo breviora, plana, acuminata, in petiolum angustata. *Racemus* pauci- v. multiflorus. *Ovarium* subsessile, apice vix constricto. *Bracteæ* setaceo-lanceolatæ. *Perianthium* $\frac{1}{10}$ unc. latum, foliolis obtusiusculis. *Columnæ* processus breves, ascendentes, apice glandulosi.

20. Habenaria attenuata, *H.f.*, n. sp. Glaberrima, caule gracili pedali bracteato, foliis ad 2 lineari-lanceolatis, racemo elongato, floribus distantibus, bracteis ovario longioribus attenuato-acuminatis, sepalis petalisque ovato-oblongis obtusis, labello 3-partito lobis linearibus, calcari gracillimo ascendente ovario longiore, antheræ loculis contiguis.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.)

Caulis tenuis. *Folia* 2–5 unc. longa, $\frac{1}{3}$–$\frac{3}{4}$ lata, acuta, plana, non petiolata. *Bracteæ caulinæ* vaginantes, longe acuminatæ. *Racemus* 3–5-pollicaris. *Flores* laxi. *Ovarium* apice contractum. *Perianthium* $\frac{1}{6}$ unc. latum. *Labelli* lobi lineares, obtusi, petalis æquilongi. *Calcar* $\frac{1}{3}$–$\frac{1}{2}$ unc. longum, attenuatum. *Columnæ* processus breves, crassi, porrecti.

Very near the Abyssinian *H. bracteosa*, A. Rich., but the flowers are much smaller and the leaves narrower.

21. Habenaria microceras, *H.f.*, n. sp. Glaberrima, 1–2-pedalis, caule folioso basi vaginato, foliis oblongis utrinque acutis 7–9-nerviis, racemo elongato densifloro, bracteis ovario brevioribus, floribus minutis, sepalis petalisque late oblongis obtusis, labello brevi 3-fido, calcari tumido obtuso æquilongo, antheris contiguis.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.)

Exemplar solitarium. *Caulis* robustus, per totam longitudinem foliosus. *Folia* 5–6, 3–4 unc. longa, 2–3 lata, membranacea, non petiolata. *Racemus* post anthesin fere pedalis, floribus imbricatis. *Bracteæ* subulato-lanceolatæ. *Ovarium* apice contractum. *Perianthium* $\frac{1}{10}$ unc. latum. *Labellum* late oblongum, lobis brevibus obtusiusculis. *Columnæ* processus breves, crassi, obtusi, divergentes.

Habit of *H. præalta*, but leaves much broader and flowers smaller.

22. Habenaria præalta, *Lindl. Gen. et Sp. Orch.* 321, *et ante*, vi. 140.

Hab. Fernando Po, alt. 10,000 feet. (Fl. Dec.)

Also a native of Bourbon, if the same; but the Fernando Po plant has the spur much longer than the ovary and not at all clavate.

23. Habenaria Mannii, *H. f.*, n. sp. Glaberrima, spithamæa, caule folioso basi vaginato, foliis lineari-lanceolatis acuminatis recurvis, bracteis late ovatis acuminatis ovario longioribus, floribus paucis amplis, sepalis falcato-ovatis acuminatis, petalis linearibus obtusis, labello angusto 3-partito, calcari æquilongo, lobis anguste linearibus, exterioribus multifidis, columna brevissima 2-cruri, antheris distantibus cruribus insertis.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.)

Caulis erectus, strictus, foliosus. *Folia* complicata, 3-nervia, 3–5-pollicaria, in bracteas floriferas abeuntia. *Bracteæ* concavæ, $\frac{3}{4}$ unc. longæ. *Flores* 1 unc. lati. *Sepala* 3-nervia, subcoriacea, patentia. *Labelli* lobi angustissimi. *Calcar* incurvum, $\frac{1}{2}$ unc. longum, sensim inflatum, obtusum. *Columna* (valde singularis) brevissima, in ramos 2 divaricatos et porrectos fissa, ramis cum processibus columnæ apice oblique truncatæ continuis. *Antheræ* loculi longe distantes, caudiculis erectis.

A most remarkable plant, very closely allied to three Abyssinian species, *H. Quartiniana*, *macrantha*, and *decorata*, in all of which the column is split to the base into two projecting arms, and the anther-lobes placed wide apart, one on each arm, with their caudicles turned up at right angles.

49. IRIDEÆ.

1. Trichonema Bulbocodium, *Ker.*

Hab. Cameroons Mountains, alt. 7000–9000 feet. (Fl. Nov.)

A small-flowered form, in no way differing from the Abyssinian. The species is found from the Channel Islands to the Canaries and Azores, and throughout the Mediterranean region, Algeria, Asia Minor, Syria, and at Socotra in the Red Sea.

2. **Geissorhiza alpina**, *H. f.*, n. sp. Caule compresso 4–10-pollicari, 2–3-floro, foliis anguste lineari-elongatis 4–6-pollicaribus, bracteis ovato-oblongis acutis ovarium excedentibus capsulam æquantibus, perianthii limbo subobliquo laciniis oblongis obtusis.

Hab. Cameroons Mountains, alt. 9000–10,000 feet. (Fl. Nov.)

Herba gracilis, glaberrima. *Folia* stricta v. lente curva, $\frac{1}{10}$ unc. lata, costa valida. *Caulis* strictus v. parum flexuosus, foliis 2–3 spathaceis auctus. *Bracteæ* exteriores $\frac{1}{2}$ unc. longæ, strictæ, virides, marginibus membranaceis, interiores breviores, obtusæ, hyalinæ. *Flores* $\frac{3}{4}$ unc. longæ, ut videtur ex sicco pallide purpureæ. *Antheræ* parvæ. *Capsula* $\frac{1}{2}$ unc. longa, cylindrico-trigona, utrinque obtusa, membranacea, polysperma. *Semina* in quovis loculo ad 12, globosa, majuscula.

This resembles a good deal the *G. Abyssinica*, but is a more slender plant, with much fewer flowers, apparently of a very pale colour; the anthers, too, are smaller and straighter. It most resembles the South-African *G. juncea*.

50. Hypoxideæ.

1. **Hypoxis villosa**, *L.*, var. foliis recurvis.

Hab. Cameroons Mountains, alt. 7000–7500 feet. (Fl. Nov.)

Apparently the same with the Cape, East-African, and Abyssinian species, but the leaves are rather more rigid and always recurved.

51. Melanthaceæ.

1. **Melanthium tenue**, *H. f.*, n. sp. 3–4-pollicare, caule tenui subunifolio 2-floro, folio anguste lineari caule longiore, perianthii foliolis lineari-oblongis obtusis medio purpureis basi vix saccatis, ovarii lobis in stylos rectos subulatos discretos sensim attenuatis.

Hab. Fernando Po, alt. 9000 feet. (Fl. April, May.)

Species parvula, facie omnino *Anguillariæ dioicæ*. *Bulbi* tunica lævis, papyracea, castanea. *Caulis* curvus v. subflexuosus, tenuis, basi vaginatus, supra basin 1-foliatus, et superne bractea basi tumida spathacea apice longe lineari auctus. *Folium* vix $\frac{1}{12}$ unc. latum, rigidum, enerve, concavum. *Flores* $\frac{1}{3}$ unc. diametro, albi, purpureo maculati.

A very distinct little species, of a peculiarly Cape genus, not hitherto found in Abyssinia.

52. Commelyneæ.

1. **Commelyna**, sp.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.) (Fruit only.)

Caulis tenuis, decumbens, linea pilorum auctus. *Folia* brevia, 1–1$\frac{1}{2}$ unc. longa, ovato-oblonga v. oblongo-rotundata, glabra, margine incrassato ciliato. *Vagina* tenuis, membranacea, marginibus longe villosis. *Spatha* breviter pedunculata, complicata, explicata latissime cordata, acuta, glaberrima, ciliolata, 2-flora.

Also an Abyssinian and Madagascar plant, very near *C. Forskahlii*, if not the same; but in the present condition of the genus *Commelyna* it is hopeless to identify a species in all its forms without a study of the whole.

2. Cyanotis abyssinica, *A. Rich.* (*ante*, vi. 21).
Hab. Fernando Po, alt. 9000 feet. Cameroons Mountains, alt. 7000–9000 feet. (Fl. Nov., Dec.)

Certainly the same as the Abyssinian plant, of which the tubers are eaten, and probably the same also with a Madagascar and S.-African one.

53. Junceæ.

1. Juncus capitatus, *Weig.*; *Kunth, Enum. Plant.* iii. 347.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Identical with the European plant, except that the glumes are rather longer and more membranous; in form they do not differ, any more than the capsules and seeds. The Cameroons specimens are triandrous. This minute species is a native of Europe, from Norway to Spain, Madeira, and the Canary Islands, and from the Azores to Greece and Middle Russia; it has not been found in Abyssinia.

2. Luzula campestris, *L.* (*ante*, vi. 22), var. *congesta*.
Hab. Fernando Po, alt. 8500–10,500 feet. Cameroons Mountains, alt. 10,000 feet. (Fl. Dec.)

Apparently identical with the European plant. The flowers are of a very dark colour. This form has not been detected in Abyssinia; but the South-African *L. Africana*, Drège, is referred to this variety by E. Meyer (Herb. Hook.).

54. Cyperaceæ.

1. Cyperus elegantulus, *Steud. Pl. Schimp.* sect. ii. no. 574.
Hab. Fernando Po, alt. 8500 feet.

This Abyssinian species is united by A. Richard with *C. atronitens*, Hochst., and perhaps rightly, but the scales are much larger and rather longer in outline.

2. Cyperus ingratus, *Kunth, Enum.* ii. 31.
Hab. Fernando Po, alt. 6000–7000 feet. Cameroons Mountains, alt. 6000–7000 feet. (Fl. Dec.–April.)

I am unable to identify this species with any but the Cape of Good Hope *C. ingratus*; it varies greatly in size, the larger specimens resembling the Abyssinian *C. derreilema*, Steud., and the smaller some states of *C. bulbosus*; but the acute glumes distinguish it from both. The small, white, smooth, triquetrous achenium is very characteristic of the Cape and Cameroons Mountains plants.

3. CYPERUS ADOENSIS, *Hochst.*; *A. Rich. Fl. Abyss.* ii. 484.
Hab. Fernando Po, alt. 8500 feet. (Fl. April.)

The scales, described by A. Richard as being rarely mucronate in the Abyssinian plant, are always so in the Fernando Po specimens.

4. KYLLINGIA MACROCEPHALA, *A. Rich. Fl. Abyss.* ii. 490.
Hab. Fernando Po, alt. 7000–8500 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Nov.–April.)

Identical with the Abyssinian plant.

5. ISOLEPIS CAPILLARIS, *Rœm. & Sch.*; *Kunth, Enum.* ii. 211. I. trifida, *Nees*; *Kunth, Enum.* ii. 213.
Hab. Fernando Po, alt. 8500–10,700 feet. Cameroons Mountains, alt. 6000–10,000 feet. (Fl. Nov.–April.)

A common tropical plant, found at various elevations, in America, Africa, and India, but not in South or North Africa. The *I. tenerrima*, Fisch., of South Russia is the same plant, I think.

6. ISOLEPIS SCHŒNOIDES, *Kunth, Enum.* ii. 209. Schœnus erraticus, *H.f.* (*ante*, vi. 22).
Hab. Fernando Po, alt. 8500–9000 feet. Cameroons Mountains, alt. 7000–9000 feet. (Fl. Nov.–April.)

This appears to me to be much nearer allied to *Schœnus* than to *Isolepis*. It is a native of mountain marshes in the eastern parts of the Cape Colony.

7. CAREX CRUCIATA*, *Nees*?; *Boott, Illustr. Carex*, t. 319. Foliis firmis.
Hab. St. Thomas's, summit of the Peak, alt. 7500 feet.

The original *C. cruciata* is a native of the Himalaya and Khasya ranges.

8. CAREX WAHLENBERGIANA, *Boott, Illustr. Carex*, t. 301 (*ante*, vi. 22).
Hab. Fernando Po, alt. 8000 feet. (Fl. Dec.)

A native of Bourbon, the Mauritius, and mountains of Abyssinia, at an elevation of 9000–10,000 feet.

9. CAREX BORYANA, *Schk.* (*ante*, vi. 22).
Hab. Fernando Po, alt. 7500–8500 feet. (Fl. Dec.)

A native of Bourbon and the Mauritius.

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* The Carices have all been named by the late Dr. Boott, F.L.S.

10. Carex æthiopica, *Schk.*; *Boott, Illustr. Carex*, t. 341–344.
Hab. Cameroons Mountains, alt. 7000–10,000 feet. (Fl. Dec.)

Also a native of Abyssinia and South Africa.

11. Carex echinochloe, *Kunth*; *Boott, Illustr. Carex*, t. 166.
Hab. Cameroons Mountains, alt. 7000 feet.

Also a native of Abyssinia, alt. 6000 feet, and probably not different from *C. Wahlenbergiana*.

55. GRAMINEÆ.

1. Panicum (Miliaria) Hochstetteri, *Steud. Syn. Gram.* 90. P. trichanthum, *A. Rich.*, non *Nees*.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Apparently a native of Abyssinia in mountain regions.

2. Panicum (Virgaria) acrotrichum, *H.f.*, n. sp. Debile, culmis gracilibus, vaginis foliisque ciliatis, foliis brevibus lanceolatis longe acuminatis planis longe pilosis, nervis 7–9, panicula laxa erecta, spiculis parvis apice setulis strictis valvulis acutis æquilongis terminatis.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)
Gramen elegans, culmis 2–3-pedalibus foliosis lævibus, nodis glaberrimis. *Vaginæ* tenues, 2–3-pollicares, glaberrimæ v. pilosulæ, marginibus superne ciliatis, ore lanuginoso. *Folia* 2–4 poll. longa, $\frac{1}{3}$–$\frac{2}{3}$ lata, plana, membranacea, ciliata, paginis pilis pallidis elongatis rigidis sparsa. *Panicula* effusa, laxa, 4–8-uncialis, ramis geminis apices versus divisis rhachique subflexuosa filiformibus lævibus. *Spiculæ* parvæ, pallidæ, $\frac{1}{12}$ unc. longæ; valvulæ 5, exterior longitudine valde variabilis, quam secunda brevior, oblongo-lanceolata, obtusa, nuda v. setulis 1–2 aucta; secunda ovato-lanceolata, acuminata, viridis, 7-costata, apicem versus setosa, setis 2–3 terminalibus valvulam æquantibus; tertia secundæ subsimilis sed nuda; 2 intimæ cymbiformes, obtusæ, coriaceæ, albidæ, lævissimæ.

A delicate grass, easily recognized by the 2–3 long bristles at the apex of the second valve of the spikelet. It is more allied in habit and other characters to the Cape *P. æquinerve*, Nees, than to any species known to me, though that plant is placed in the section *Virgatæ*.

3. Panicum (Virgaria) monticolum, *H.f.*, n. sp. Debile, culmis gracilibus, vaginis foliisque glabriusculis, foliis brevibus lanceolatis acuminatis planis striatis obscure 7-nerviis, panicula laxa pauciflora erecta, spiculis parvis oblongis obtusis glaberrimis.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Feb.)
Gramen elegans, culmis basi prostratis ramosis sulcatis demum ascendentibus 1–2-pedalibus foliosis lævibus, nodis glaberrimis. *Vaginæ* tenues, 1–2 unc. longæ, superne setulis curvis rigidis ciliatæ; ore glabro.

Folia 1½–2 unc. longa, ¼–½ lata, plana, membranacea, viridia, marginibus non ciliatis, nervis primariis ad 7 a secundariis perplurimis vix distincta, nervulis paucis transversis trabeculatis, paginis lævibus. *Panicula* 2–3-pollicaris, laxa, ramis solitariis ½–1-pollicaribus apices versus 1–2-floris; rhachi ramisque filiformibus lævibus. *Spiculæ* pedicellatæ, 1/12 unc. longæ, glaberrimæ. *Valvula* exterior brevis, late ovata, apice rotundata; secunda et tertia consimiles, concavæ, oblongæ, obtusæ, læves, 5-nerves; 2 intimæ cymbiformes, coriaceæ, obtusæ, læves.

Similar in habit, &c. to *P. acrotrichum*, but at once distinguished by the glabrous leaves, fewer-flowered panicle, its solitary branches, and the glabrous, blunt, 5-nerved glumes, which are not ribbed.

4. PANICUM (MILIARIA) PUSILLUM, *H. f.*, n. sp. Molliter laxe villosum, parvulum, debile, culmis decumbentibus filiformibus foliosis, foliis parvis lanceolatis, panicula laxa ovata ramosa, ramis deflexis 3–4-floris, ramis ramulisque flexuosis, valvulis 3 spiculæ costatis longe setosis.

Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec.)

Debile, annuum, pusillum, totum pilis mollibus patentibus elongatis laxe villosulum, culmis decumbentibus laxe foliosis fere capillaribus 2–3-pollicaribus, nodis non barbatis. *Vaginæ* ⅙ unc. longæ, laxæ, costatæ. *Folia* ¼–⅓ unc. longa, anguste lanceolata, acuminata, plana, multicostata, utrinque villosula. *Panicula* pollicaris, erecta, ramis solitariis brevibus capillaribus. *Spiculæ* vix 1/14 unc. longæ. *Valvulæ* 3 exteriores subæquales, membranaceæ, virides, ovatæ, acutæ, longe pilosæ, pilis basi tuberculatis; exterior 3-costata, paulo minor; 2 sequentes 5-costatæ, costis acutis; 2 intimæ cymbiformes, coriaceæ, glaberrimæ, læves, subacutæ.

A very remarkable little species, quite unlike any with which I am acquainted; its habit is that of *Isachne dispar*.

5. ISACHNE REFRACTA, *H. f.*, n. sp. Fere glaberrima, culmis basi geniculatis decumbentibus demum erectis gracilibus strictis lævibus, vaginis lævibus sulcatis versus margines pilosulis, foliis refractis anguste lanceolatis longe acuminatis strictis scabrulis marginibus incurvis, panicula effusa, ramis strictis hic illic longe pilosis, valvulis ovatis subacutis valide costatis.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Gramen rigidulum, perenne, 3-unc. ad pedale, culmis cæspitosis basi decumbentibus ramosis. *Folia* stricta, ½–2 unc. longa, omnia deflexa. *Culmi* superne gracillimi, lævissimi. *Panicula* 1–3-pollicaris, late ovata, fere æque lata, ramis alternis capillaribus flexuosis ramulis 1–4-floribus. *Spiculæ* pedicellatæ, 1/12 unc. longæ, purpureæ, ovatæ, subacutæ. *Valvulæ* glabræ, exterior minor ovato-oblonga acuta 3-costata, 2 sequentes subæquales 5-costatæ; flosculus inferior (interdum neuter v. imper-

fectus) membranaceus; hermaphroditus 2-paleaceus, valvulis oblongis obtusis cymbiformibus coriaceis lævibus.

The refracted leaves and costate subacute glumes at once distinguish this remarkable species.

6. Pennisetum (Gymnothrix) riparioides, *Hochst.*?; *A. Rich. Fl. Abyss.* ii. 383.

Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec., Jan.)

The rachis and apex of the culm are more villous than in the Abyssinian specimen, but the plants are otherwise very similar; the whole genus, however, requires revision before the limits of this or any other species can be established. The spikelets are sometimes very lax and few, at others dense; the setæ are about as long as the glumes, and vary greatly in number.

7. Vilfa montana, *H. f.*, n. sp. Glaberrima, lævis, spithamæa ad pedalis, culmis cæspitosis simplicibus gracilibus erectis, foliis radicalibus curvis elongato-subulatis marginibus involutis scabrulis, panicula laxa ovata, ramis paucis verticillatis capillaribus apices versus 2–3-floris, spiculis glaberrimis nitidis, gluma inferiore superiore lanceolato acuminato $\frac{1}{2}$ breviore, flosculo gluma superiore breviore.

Hab. Cameroons Mountains, alt. 7000–9000 feet. (Fl. Dec.)

Gramen elegans, perenne. *Folia* radicalia $1\frac{1}{2}$–2 unc. longa, vix $\frac{1}{14}$ unc. lata, rigidula, patenti-recurva, e vagina brevissima sensim subulato-attenuata, sulcata. *Culmus* gracillimus, 1–2-foliatus, vaginis elongatis tenuibus sulcatis, ligula 0. *Panicula* 2 unc. longa, verticillis ad 6, rhachi ramisque capillaribus, infimis deflexis. *Spiculæ* $\frac{1}{8}$ unc. longæ, fuscæ, nitidæ. *Gluma* inferior obtusiuscula, superior acuta.

A beautiful small grass, almost identical in the inflorescence, and size, structure, and colour of the spikelets, with the S.-African *V. centrifuga*, Nees; but the branchlets are only in threes, the leaves infinitely narrower, and the whole plant very slender: the two grasses are, however, most closely allied.

8. Deyeuxia Mannii, *H. f.*, n. sp. Culmis elongatis gracillimis foliosis 2–3-pedalibus, vaginis sulcatis scabrulis, foliis strictis anguste lineari-lanceolatis, ligulis elongatis fissis, panicula elongata effusa multiflora rhamis rachique capillaribus, glumis lanceolato-subulatis glabris enerviis carina scabrida, palea inferiore villosa apice breviter 4-setosa arista basilari palea subduplo longiore, superiore æquilonga apice 2-setosa basi villosa et setula villosa aucta.

Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 8000–13,000 feet. (Fl. Dec.–May.)

Gramen gracile, culmis fastigiatis, parce ramosis. *Folia* 6 unc. longa,

$\frac{1}{6}$ unc. lata, stricta, plana v. involuta, minute scabrula. *Panicula* 3–4 unc. longa, erecta v. inclinata, ramis ramulisque capillaribus. *Spiculæ* pallide purpureæ, nitidæ, $\frac{1}{6}$–$\frac{1}{4}$ unc. longæ, arista capillari.

The only species of the genus hitherto found in tropical or South Africa.

9. MICROCHLOA SETACEA, *Br.*; *Steud. Syn. Gram.* 202.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Specimens very small and annual, possibly seedlings only; the flowers, &c., are identical with those of the Indian plant, which is found also in Australia, Abyssinia, S. Africa, S. America, and the plains of the Niger valley.

10. DESCHAMPSIA CÆSPITOSA, *Pal. Beauv.*, et var. *latifolia* (*antè*, vi. 23). D. latifolia, *Hochst.*; *A. Rich. Flor. Abyss.* ii. 413.
Hab. Fernando Po, alt. 9000–10,000 feet. Cameroons Mountains, alt. 10,000–12,000 feet. (Fl. Dec., Jan.)

11. AIRA CARYOPHYLLEA, *Linn.*
Hab. Cameroons Mountains, alt. 7000–10,000 feet. (Fl. Dec., Jan.)

Also a native of Abyssinia and S. Africa.

12. AIRA PICTIGLUMA, *Steud. Syn. Gram.* 221.
Hab. Cameroons Mountains, alt. 9000–13,500 feet. (Fl. Dec., Jan.)

Also a native of Abyssinia.

13. AVENA LACHNANTHA. Trisetum lachnanthum, *Hochst.* (*ante*, vi. 23).
Hab. Fernando Po, alt. 8000–9000 feet. Cameroons Mountains, alt. 7000–9000 feet. (Fl. Dec., Jan.)

This, having a hairy ovary, should, according to Steudel, be transferred to *Avena*. The villose character of the lower palea is variable. Also a native of Abyssinia.

14. AVENA NEESII. Trisetum, *Hochst.*; *Steud. Syn. Gram.* 227.
Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec., Jan.)

This also is an Abyssinian plant. The spikelets vary in size and colour; the lateral laciniæ of the lower palea are sometimes aristate, at others simply acuminate. Sheaths of the lower leaves glabrous, or a little hairy. Ovary villose.

15. LOUDETIA ELEGANS, *Hochst.*; *Steud. Syn. Gram.* 238.
Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec., Jan.)

A native of the mountains of Abyssinia.

16. DANTHONIA STREBLOCHÆTA, *Steud. Syn. Gram.* 245.
Hab. Cameroons Mountains, alt. 8000 feet. (Fl. Dec.)

These specimens of this very remarkable grass agree entirely with the Abyssinian. It differs from the generic character of *Danthonia* in the flowers much exceeding the glumes. The habit of the plant is that of *Festuca gigantea*, which it further closely resembles in colour, stature, and texture.

17. POA NEMORALIS, *L.*
Hab. Fernando Po, alt. 7500 feet. Cameroons Mountains, alt. 7000–10,000 feet. (Fl. Dec.–April.)

Not hitherto found in Abyssinia. There are two forms in the Cameroons Mountains: one like the ordinary European; the other, from a lower elevation, of greater size, with more effuse panicles, the branches usually solitary, elongated, and spreading.

18. KŒLERIA CRISTATA, *Pers.* K. convoluta, *Hochst.*; *Steud. Syn. Gram.* 293.
Hab. Cameroons Mountains, alt. 8000–12,000 feet. (Fl. Dec., Jan.)

A South-African and Abyssinian plant.

19. FESTUCA BROMOIDES, *Linn.*
Hab. Cameroons Mountains, alt. 7000–10,000 feet. (Fl. Dec.)

Common in Abyssinia and South Africa.

20. FESTUCA SIMENSIS, *Hochst.*; *Steud. Syn. Gram.* 314.
Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.–March.)

21. FESTUCA GIGANTEA, *Vill.*
Hab. Fernando Po, alt. 8500 feet. (Fl. March.)

A larger-flowered form than the European, with larger florets; but I can find no distinctive characters. The ovary is glabrous, with terminal stigma.

22. FESTUCA SCHIMPERIANA, *A. Rich.* (*ante*, vi. 23). F. restituta, *Steud. Syn. Gram.* 314.
Hab. Fernando Po, alt. 8500 feet. Cameroons Mountains, alt. 8000–13,500 feet. (Fl. Dec.–March.)

Varies extremely in stature, and in the inflorescence either dense or lax.

23. TRIPOGON MAJOR, *H.f.*, n. sp. Glaberrimus, foliis setaceo-involutis, spiculis ½-poll. 8–12-floris, glumis lanceolato-subulatis acuminatis, rhachi sericeo-villosa, palea inferiore tridentata breviter aristata.
Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec.)
Gramen cæspitosum, strictum, pedale et ultra. *Folia* 4–6-pollicaria, angustissima, strictiuscula, glaberrima v. pilis paucissimis conspersa,

ligula 0. *Culmus* lævis. *Spica* 4–6 unc. longa. *Spiculæ* remotæ, compressæ. *Glumæ* juniores integerrimæ v. obscure 3-dentatæ, demum apice erosæ, exterior rhachi oblique inserta. *Palea* inferior apice minute 3-dentata, arista brevi recta terminata, basi sericeo-barbata, cæterum glaberrima, 3-nervis; superior apice truncata, marginibus ciliolatis. *Ovarium* lineare, glaberrimum, stylis terminalibus divaricatis, stigmatibus brevibus plumosis.

Much the largest species hitherto discovered. The genus is an Indian, Senegambian, and Abyssinian one, but is not hitherto known in South Africa.

24. BROMUS SCABRIDUS, *H.f.*, n. sp. Elatus, gracilis, culmis scabridis, vaginis retrorsum pilosis et scabridis, foliis elongatis planis utrinque scabridis supra pilosis, panicula laxa ampla, ramis oppositis v. ternis 1–4-floris pedicellisque capillaribus et scabridis, spiculis amplis 6–8-floris, palea superiore valide 5-nervia pilosa et scabrula, arista terminali palea breviore recta.

Hab. Cameroons Mountains, alt. 7000–8000 feet. (Fl. Dec.)

Culmi 3–4-pedales, tenues, striati. *Vaginæ* graciles, sulcati, 6–8-pollicares, ligula brevi lacera. *Folia* caulina 4–6 unc. longa, $\frac{1}{6}$ lata, viridia, striata. *Panicula* erecta, pedalis, internodiis 4–5 distantibus, ramulis patentibus flexuosis 3–4-pollicaribus. *Spiculæ* pollicares, $\frac{1}{3}$ unc. latæ, virides, nervosæ, flosculis compressis. *Glumæ* aristato-acuminatæ, scabridæ. *Palea* inferior $\frac{1}{2}$-pollicaris, scabrida et pilosa, marginibus pectinato-ciliatis, arista fere terminali $\frac{1}{4}$ unc. longa. *Ovarium* apice villosum, stylis lateralibus.

A very handsome grass, nearly allied to *B. asper*, but more scabrid, with far larger and more strongly nerved compressed spikelets. It is also very nearly allied to the *B. cognatus*, Steud., of Abyssinia and *B. pectinatus*, Thunb., of South Africa.

25. BRACHYPODIUM SYLVATICUM, *R. & S.* (*ante*, vi. 23).

Hab. Fernando Po, alt. 7000 feet.

This is an Abyssinian plant (*B. flexum*, Nees), and also found in South Africa, India, and tropical America.

26. ANDROPOGON (GYMNANDROPOGON) DISTACHYUS, *L.*

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec., Jan.)

A native of South Europe and North Africa, as well as of Abyssinia. (*A. polyatherus*, Hochst.)

27. ANDROPOGON (GYMNANDROPOGON) BRACHYATHERUS, *Hochst.*?; *Steud. Syn. Gram.* 372.

Hab. Cameroons Mountains, alt. 8000 feet. (Fl. Dec.)

There are two forms thus marked from Abyssinia (Schimper): viz., No. 1635, a stout, broad-leaved form, tallying with the description of Steudel, of which I have very imperfect flowers; and another (Herb. Mus. Paris., Schimper, No. 95) with slender culms and very narrow, strict leaves. The Cameroons specimens accord best with the latter of these. The spikes are sometimes nearly 6 inches long. The second glume of the lower (sessile) spikelet is shortly awned both in Schimper's 95. and the Cameroons plants. The outer glume of the pedicelled spikelet is sometimes awned in the Cameroons specimens and sometimes muticous, but always awned in Schimper's 95. specimens.

28. ANDROPOGON (GYMNANDROPOGON) MANNII, *H. f.*, n. sp. Spithamæus ad pedalis, culmis cæspitosis simplicibus basi compressis foliosis apice sericeis, foliis distichis brevibus parce pilosis, vaginis latis compressis, lamina lineari acuta, spicis 2–5-pollicaribus rhachi ciliata, spiculis lanceolatis lævibus, inferioris basi barbatæ valvula exteriore acuminata subaristata, interiore aristata, arista glumam subæquante, superioris valvulis aristato-acuminatis.—*Ante*, vi. 23 (Gymnandropogon, sp?).

Hab. Fernando Po, alt. 8500–9000 feet. (Fl. Dec.–April.)

Glaberrima nisi pili sparsi in pagina superiore folii, apice culmi et rhachibus spicarum. *Vaginæ* 1 unc. longæ, $\frac{1}{6}$ unc. latæ, ligula brevissima sericea. *Folia* subcoriacea, stricta, 2 unc. longa, plana v. complicata, non convoluta. *Culmi* stricti, erecti, subrobusti. *Spicæ* purpurascentes. *Spiculæ* laxe imbricatæ, fere $\frac{1}{4}$ unc. longæ. *Flos* inferior *fœmineus*, superior *masculus*.

I cannot identify this with any described species, though it very closely resembles several Cape and African ones. Its short, stout, tufted habit, much compressed, glabrous, short sheaths, and short, stout, not convolute leaves distinguish it at once from the preceding.

29. ANDROPOGON (CYMBOPOGON) SMITHIANUS, *H. f.*, n. sp. Patentim pilosus v. glabratus, culmis 1–2-ped. foliosis apice ramosis, foliis elongatis superiorum vaginis inflatis, pedunculis longissime sericeis spathis inclusis, spicis 3–4 brevibus paucifloris densissime fulvo-villosis, spiculæ sessilis valvula exteriore truncata, interioris arista torta valvula duplo longiore.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec., Jan.)

Gramen pulcherrimum, erectum. *Vaginæ* longe pilosæ, ligulis breviusculis membranaceis. *Folia* 4–8 unc. longa, $\frac{1}{6}$–$\frac{1}{5}$ lata, scabrula. *Pedunculi* plurimi, graciles, 2–3 unc. longi, apices versus patentim longe pilosi. *Spicæ* pollicares et breviores, densissime sericeo-villosæ, pilis fulvo-brunneis.

A most beautiful species, at once distinguishable by the dark yellow-brown silky hairs of the spikes.

30. ANDROPOGON (CYMBOPOGON) PUSILLUS, *H. f.*, n. sp. Annuus, patentim pilosus, culmis gracilibus decumbentibus 2–5-pollicaribus foliosis, vaginis compressis, foliis linearibus acuminatis planis, pedunculis spathis inclusis, spicis binis brevibus paucifloris, spicularum valvulis exterioribus tenuiter aristatis dorso profunde bipertusis, floris hermaphroditi arista valida torta spicula pluries longiore.

Hab. Cameroons Mountains, alt. 7000 feet. (Fl. Dec.)

Gramen humile, debile, culmis e basi ramosis. *Vaginæ* $\frac{1}{4}$–$\frac{1}{2}$ unc. longæ, ligula brevi obtusa. *Folia* $\frac{1}{2}$–1 unc. longa, stricta, $\frac{1}{8}$ unc. lata, utrinque longe pilosa et basin versus longissime ciliata. *Spathæ* 1–1$\frac{1}{2}$-pollicares, glabræ, pedunculos filiformes glaberrimos distachyos velantes. *Spicæ* (aristis exclusis) $\frac{1}{2}$ unc. longæ. *Spiculæ* 8–10; glumis glabris $\frac{1}{6}$ unc. long., rhachi pedicellisque dense subdistiche sericeo-villosis. *Valvulæ* nitidæ, virides, exteriores apice bifidæ, inter dentes aristatæ, arista tenui valvulæ æquilonga, punctis intrusis magnis collateralibus. *Arista* flosculi hermaphroditi 1–1$\frac{1}{2}$ unc. longa, valida, torta, brunnea, scabrula.

A most distinct and very singular little grass, quite unlike any other known to me.

31. ARUNDINELLA ELEGANTULA, *H. f.*, n. sp. 3–4-pollicaris, annua, longe laxe pilosa, foliis $\frac{1}{2}$-unc. lanceolatis acuminatis, panicula ovata ramis capillaribus flexuosis, glumis ovatis acuminatis longe pilosis, flosculi hermaphroditi palea inferiore bifida laciniis tenuiter aristatis dorso penicillis 2 pilorum aucta, inter lacinias aristata, arista valida torta spicula triplo longiore.

Cameroons Mountains, alt. 6000–7000 feet. (Fl. Dec.)

Gramen pusillum, debile, basi ramosum, longe laxe pilosum. *Culmi* basi decumbentes, tenues. *Folia* patentia, undulata v. recurva, ore longe ciliato. *Panicula* 1–1$\frac{1}{2}$-pollicaris, ramis plurimis flexuosis glaberrimis erecto-patentibus 2–3-floris ramulisque capillaribus. *Spiculæ* $\frac{1}{8}$ unc. longæ. *Glumæ* longe laxe patentim subsetosæ, setulis basi tuberculatis, ovatæ, acuminatæ. *Palea* inferior fl. masculi glumis subsimilis sed longior, apice aristulata; fl. fertilis palea inferior brevis, basi et supra medium utrinque penicillis albis sericeis pilorum aucta, aristis lateralibus tenuissimis, intermedia valida, torta, geniculata, $\frac{1}{3}$ unc. longa.

A very beautiful and distinct little grass, allied to the Abyssinian and Indian *A. Wallichii* (*A. pumila*, Steud.), but very different in its much smaller size, much larger, more hairy spikelets, and in the curious pencils of hairs on the lower fertile palea, which resemble those of the Australian *Danthonia semiannularis*. The

genus is South African, but not hitherto found in extratropical North Africa.

CRYPTOGAMIA.

56. FILICES.

1. GLEICHENIA DICHOTOMA, *Willd.*
Hab. St. Thomas's Island, summit of the Peak.

2. CYATHEA, sp.
Hab. St. Thomas's Island, alt. 3000–7000 feet. Fernando Po and Cameroons Mountains.

3. ADIANTUM ÆTHIOPICUM, *L.*
Hab. Cameroons Mountains, alt. 7000 feet.

4. LONCHITIS GLABRA, Bory.
Hab. St. Thomas's Island, top of the Peak. Cameroons Mountains, alt. 7000 feet. Fernando Po.

A native of Natal and Bourbon.

5. HYPOLEPIS PTERIDIOIDES, *Hook.*
Hab. Fernando Po and Cameroons Mountains, alt. 7000 feet.

6. CHEILANTHES FARINOSA, *Kaulf.*
Hab. Cameroons Mountains, in lava-fields, alt. 7000–10,000 feet.

7. PELLÆA HASTATA, *Link.*
Hab. Cameroons Mountains, alt. 7000 feet.

8. PTERIS 4-AURITA, *Retz.*
Hab. Cameroons Mountains, alt. 7000 feet.

9. PTERIS FLABELLATA, *Th.*
Hab. Fernando Po, alt. 7000 feet.

10. PTERIS AQUILINA, *Linn.*
Hab. Cameroons Mountains, alt. 7000 feet.

Also found at the level of the sea, on the Bagroo River and elsewhere in tropical Africa.

11. ASPLENIUM ANISOPHYLLUM, *Kze.*
Hab. Cameroons Mountains, alt. 3000–7000 feet.

12. ASPLENIUM ERECTUM, *Bory.*
Hab. Fernando Po and Cameroons Mountains, alt. 3000–7000 feet.

A fern of ubiquitous tropical distribution.

13. ASPLENIUM MONANTHEMUM, *L.*
Hab. Fernando Po, alt. 8000 feet.

14. Asplenium protensum, *Schrad.*
Hab. Fernando Po and Cameroons Mountains, alt. 7000 feet.

A native of Abyssinia, Mauritius, and South Africa.

15. Asplenium Serra, *Langsd.*
Hab. Fernando Po and Cameroons Mountains, alt. 3000–7100 feet.

16. Asplenium furcatum, *Th.* Var. parvula, pinnis integris brevibus.
Hab. Cameroons Mountains, alt. 8000 feet.

The same state occurs in the Canary and Cape de Verd Islands.

17. Asplenium Adiantum-nigrum, *L.*
Hab. Cameroons Mountains, on lava-fields, alt. 10,000 feet.

Also found in Abyssinia, South Africa, and elsewhere on the tropical mountains of the Old and New World.

18. Asplenium Abyssinicum, *Fée.*
Hab. Fernando Po and Cameroons Mountains, alt. 3000–7000 feet.

An Abyssinian fern.

19. Asplenium brachypteron, *Kze.*
Hab. Cameroons Mountains, alt. 3000–7000 feet.

20. Asplenium filix-fœmina, *L.*
Hab. Cameroons Mountains, alt. 7000 feet.

A small form of this very variable plant, of which other forms are found in Abyssinia, South Africa, &c.

21. Asplenium aspidioides, *Schl.*
Hab. Fernando Po and Cameroons Mountains, alt. 5000–7000 feet.

A Madagascar fern.

22. Aspidium aculeatum, *L.*
Hab. Fernando Po and Cameroons Mountains, alt. 7000–10,000 feet.

Also found in Abyssinia, South Africa, and elsewhere throughout the globe where the climate is sufficiently cool.

23. Nephrodium crinibulbon, *Hook.*
Hab. St. Thomas's Island, summit of the Peak. Cameroons Mountains, alt. 4000 feet.

24. Nephrodium filix-mas, *L.*
Hab. St. Thomas's Island, alt. 6000 feet.

A native of Abyssinia, Southern and Eastern Africa, and elsewhere throughout the world in cool moist climates.

25. NEPHRODIUM INÆQUALE, *Hook.*
Hab. Fernando Po and Cameroons Mountains, alt. 7000–10,000 feet.

26. NEPHROLEPIS TUBEROSA, *Presl.*
Hab. St. Thomas's Island and Cameroons Mountains, alt. 4000–5000 feet.

27. POLYPODIUM VILLOSISSIMUM, *Hook.*
Hab. St. Thomas's Island, alt. 6000 feet.

Also found at Sierra Leone.

28. POLYPODIUM RUGULOSUM, *Lab.*
Hab. Fernando Po, alt. 7000 feet.

One of the most widely distributed of Ferns in the tropics and south temperate zone.

29. POLYPODIUM, n. sp.
Hab. Cameroons Mountains, alt. 7000 feet.

30. POLYPODIUM OPPOSITIFOLIUM, *Hook.*
Hab. Peak of St. Thomas's Island, alt. 5000 feet.

31. POLYPODIUM LORIFORME, *Wall.*
Hab. Peak of St. Thomas's Island, alt. 4000–5000 feet. Fernando Po, alt. 3000–5000 feet.

32. POLYPODIUM LEPIDOTUM, *Willd.*
Hab. Cameroons Mountains, alt. 9000 feet.

An American fern; also found in St. Helena.

33. GYMNOGRAMME JAVANICA, *Bl.*
Hab. St. Thomas's Island, alt. 4000–5000 feet. Fernando Po, alt. 10,000 feet. Cameroons Mountains, alt. 3000–7000 feet.

A widely distributed fern, extending through India to the Sandwich Islands.

34. GYMNOGRAMME TOTTA, *Schlecht.*
Hab. Fernando Po and Cameroons Mountains, alt. 1000–7000 feet.

Found also in Madeira, throughout tropical Africa, and India.

35. GYMNOGRAMME LANCEOLATA, *Sw.*
Hab. Fernando Po and Cameroons Mountains, alt. 3000–7000 feet.

A native of South Africa, India, and South America.

36. ACROSTICHUM HYBRIDUM, *Bory.*
Hab. Fernando Po and Cameroons Mountains, alt. 4000–8000 feet.

A Bourbon and Tristan-d'Acunha fern.

37. Acrostichum Aubertii, *Desv.*
Hab. Fernando Po, alt. 7000 feet.

A Bourbon, East-African, and Venezuelan fern.

38. Acrostichum splendens, *Willd.*
Hab. Fernando Po and Cameroons Mountains, alt. 5000–6000 feet.

Found also in Sierra Leone, Madagascar, Bourbon, Ceylon, and the Sandwich Islands.

39. Acrostichum squamosum, *Sw.*
Hab. Cameroons Mountains, alt. 6000 feet. Tropical America, Indian and Pacific Islands, Madeira and Azores.

40. Acrostichum sorbifolium, *Linn.*
Hab. Fernando Po, from the sea to 5000 feet.

A very widely dispersed fern.

57. Ophioglosseæ.

1. Ophioglossum reticulatum, *Linn.*
Hab. Fernando Po, summit of the Peak.

A form of *O. vulgatum*, found in many warm countries.

58. Lycopodiaceæ.

1. Lycopodium crassum, *Hook.*
Hab. Cameroons Mountains, alt. 10,500 feet.

Also a native of Bourbon, Kerguelen's Land, and the Andes.

2. Selaginella, sp.
Hab. Fernando Po, alt. 8000 feet.

3. Selaginella, sp.
Hab. St. Thomas's Island, alt. 5000 feet.

59. Musci. (Described by Mr. Mitten, *ante*, p. 148.)

		feet.
Leptotrichum capillaceum, *Hedw.*	Cameroons Mountains	7,000
Dicranum obliquatum, *Mitt.*, n. sp.	Clarence Peak.	
—— stramineum, *Mitt.*, n. sp.	Cameroons Mountains	9,000
—— nivale, *Brid.*	„	9–10,000
—— ericetorum, *Mitt.*	„	7–10,000
Didymodon radicosus, *Mitt.*, n. sp.	„	8,000
—— pungens, *Mitt.*, n. sp.	„	10,000
Didymodon flexifolius, *Hook. & Tayl.*	„ Clarence Peak, in the crater.	8,000

		feet.
—— purpureus, *Hedw.*	Cameroons Mountains	8,000
—— cyathicarpus, *Mont.*	,,	8,000
Anœctangium spathulatum, *Mitt.*, n. sp.	,,	8,000
Tortula cylindrica (Weissia, *Bruch*)	,,	7,000
Grimmia Abyssinica, *Br. & Sch.*	,,	12,000
Zygodon semitortus, *Mitt.*, n. sp.	,,	8,000
Macromitrium levatum, *Mitt.*, n. sp.	,,	8–10,000
Entosthodon curvipes, *C. Muell.*	,,	7–8,000
Funaria hygrometrica, *Dill.*	,,	7,000
Bartramia stricta, *Brid.*	,,	7,000
—— commutata, *Mitt.*	,,	12,000
—— Halleriana, *Hedw.*	,,	9,000
Philonotis Wilsoni, *Br. & Sch.*	Clarence Peak	8,500
Breutelia gnaphalea, *Mitt.*	Cameroons Mountains	12,000
—— diffracta, *Mitt.*	,,	5–9,000
Mielichhoferia ovalis, *Mitt.*, n. sp.	,,	10,000
—— basilaris, *Br. & Sch.*	,,	7–8,000
Bryum julaceum, *Sm.*	,,	7,000
—— argenteum, *L.*	,,	8,000
—— alpinum, *L.*	,,	12,000
—— pallescens, *Schw.*	,,	7–12,000
—— flexifolium, *Br. & Sch.*	,,	8,000
—— suberectum, *Mitt.*, n. sp.	Clarence Peak.	
—— subuliferum, *Mitt.*, n. sp.	Peak of St. Thomas's.	
Hypnum vellereum, *Mitt.*, n. sp.	Cameroons Mountains	8,000
—— spiculosum, *Mitt.*, n. sp.	,,	(no elev.)
Meteorium imbricatum, *Beauv.*	,, Clarence Peak	4–7,000 8,000
Trachyloma stipitatum, *Mitt.*, n. sp.	,,	7,500
Stereodon Abyssinicus, *Br. & Sch.*	Cameroons Mountains	7–8,000
—— mollicellus, *Mitt.*, n. sp.	,,	4–5,000
—— nitidifolius, *Mitt.*, n. sp.	Clarence Peak	8,000
—— fruticellus, *Mitt.*, n. sp.	,,	3–8,000
—— frondosus, *Mitt.*, n. sp.	,,	3–8,000
Lepidopilum deflexum, *Mitt.*, n. sp.	Cameroons Mountains	4,000
Neckera longirostris, *Hook.*	,,	7,000
—— ramulosa, *Mitt.*, n. sp.	,,	4,000
—— pennata, *Hedw.*	Clarence Peak	6,000
—— remota, *Br.*	Cameroons Mountains	7,000
Hedwigia imberbis, *Hook. & Tayl.*	,,	10–12,000
—— rupestris, *Mitt.*, n. sp.	,,	10,000
Leskea intricata, *Mitt.*, n. sp.	,,	7,000
—— ramusculosa, *Mitt.*, n. sp.	Clarence Peak.	
Rhacopilum Africanum, *Mitt.*, n. sp.	Cameroons Mountains	7,000
Fissidens viridulus, *Schw.*	,,	7,000

		feet.
Mnium rostratum, *Schw.*	Clarence Peak.	
Daltonia patula, *Mitt.*, n. sp.	,,	7,000
—— longinervis, *Mitt.*, n. sp.	Cameroons Mountains	4,000
—— splachnoides, *Hook. & Tayl.*	,,	8,000
Cyclodictyon (Hookeria) lætevirens, *Hook. & Tayl.*	Clarence Peak	8,000
Hypopterygium laricinum, *Hook.*	,,	
Polytrichum Simense, *Br. & Sch.*	Cameroons Mountains	8–10,000
—— juniperinum, *Hedw.*	,,	8–10,000
—— commune, *Linn.*	Clarence Peak	15,000

60. Hepaticæ. (Described by Mr. Mitten, *ante*, p. 164.)

Jungermannia dentata, *Raddi*	Cameroons Mountains	7,000
—— hirtella, *Weber*	,,	7,000
—— Abyssinica, *Nees*	,,	7,000
—— geminifolia, *Mitt.*, n. sp.	Peak of St. Thomas's.	
Plagiochila squamulosa, *Mitt.*, n. sp.	Cameroons Mountains	7–8,000
—— dichotoma, *Nees*	,,	4,000
Leioscyphus repens, *Mitt.*, n. sp.	Clarence Peak	8,000
Lophocolea devexa, *Mitt.*, n. sp.	Peak of St. Thomas's.	
—— bidentata, *Nees*	Clarence Peak	8,000
—— muricata, *Nees*	,,	8,000
Gymnanthe decipiens, *Hook.*	,,	8,000
—— biloba, *Mitt.*, n. sp.	,,	8,000
Physiotium sphagnoides, *Hook.*	Peak of St. Thomas's.	
Sendtnera juniperina, *Sw.*	,,	
—— diclados, *Endl.*	Clarence Peak.	
Radula bipinnata, *Mitt.*, n. sp.	Cameroons Mountains	4,000
—— tamariscina, *Mitt.*, n. sp.	Peak of St. Thomas's.	
—— voluta, *Tayl.*	Cameroons Mountains	8,000
Madotheca subdentata, *Mitt.*, n. sp.	,,	4,000
Lejeunia acuta, *Mitt.*, n. sp.	Clarence Peak.	
—— Montagnei, *Gottsche*	Peak of St. Thomas's.	
Frullania emergens, *Mitt.*, n. sp.	Cameroons Mountains	8,000
—— depressa, *Mitt.*, n. sp.	,,	8,000
—— cordata, *Mitt.*, n. sp.	,,	8,000
—— angulata, *Mitt.*, n. sp.	,,	8,000
Plagiochasma Aitonia, *Lndb. & Nees*	,,	7,000
Dumortiera hirsuta, *Schw.*	,,	4,000
	Clarence Peak.	
Targionia hypophylla, *Linn.*	Cameroons Mountains	7,000
Anthoceros dichotomus, *Raddi*	,,	7,000
Dendroceros crispatus, *Nees*	Peak of St. Thomas's.	

61. Lichenes. (Named by Dr. Nylander.)

		feet.
Leptogium Burgessii, *Lightf.*	Cameroons Mountains	7,000
—— inflexum, *Nyl.*	„	
Stictina quercizans, *Mich.*	„	
—— fuliginosa, *Dicks.*	„	
Peltigera polydactyla, var. dolichorhiza, *Nyl.*	„	
—— rufescens, *Hoffm.*	„	
—— polydactyloides, *Nyl.*	„	
Usnea ceratina, *Ach.*	„	8,000
—— florida, *Ach.*	„	8,000
Stereocaulon turgescens, *Nyl.*	„	7,000
—— denudatum, *Fl.*	„	
Cladonia diplotypa, *Nyl.*	„	6,000
—— fimbriata, *Hoffm.*	„	
Ramalina scopulorun, *Ach.*	„	8,000
Physcia speciosa, var. dactylifera, *Nyl.*	„	8,000
—— ——, var. hypoleuca	„	8,000
—— dilatata, *Nyl.*	„	8,000
—— speciosa, *Wulf.*	„	8,000
Parmelia megaleia, *Nyl.*	„	8,000
—— revoluta, *Fl.*	„	
—— sp.? non typica	„	8,000
Urceolaria scruposa, *Ach.*	„	
Lecanora subfusca, var. allophora	„	

On the Genus *Euptelea*, Sieb. & Zucc.

By Dr. J. D. Hooker and Dr. T. Thomson.

[Plate II.]

In Siebold and Zuccarini's 'Flora of Japan' (a work which contains figures and descriptions of a great number of remarkable forms of plants, many of which extend to the eastern provinces of India) there is figured, at t. 72, a genus *Euptelea*, referred provisionally by the authors to Ulmaceæ, the absence of ripe fruit making it impossible to determine its affinities with certainty.

In preparing for distribution the monochlamydeous plants of the Griffithian Herbarium, we have been so fortunate as to meet with specimens in fruit of a plant evidently belonging to the same genus, perhaps even specifically identical with that figured and described by Siebold and Zuccarini. These specimens were collected by Griffith on the mountain Thumathaya, in the Mishmi country to the east of the valley of Assam, in an extremely humid district, the flora of which has very intimate relations to that of China and Japan. On the ticket attached to the specimens, Griffith refers them to Cupuliferæ; but he had, no doubt, examined them in the most cursory manner, as we can find no reference to the plant in any of his published works.

As the Mishmi specimens serve to complete the character of this very curious genus, and give better data for fixing its place in the system, we have thought it desirable to lay the accompanying drawing before the Society. Instead of describing Griffith's plant at length, it may be as well to give a brief abstract of the character of the flowering plant, and then to point out the additions which the new materials have enabled us to make.

In the Japan plant, according to Siebold and Zuccarini, the flowers are destitute of perianth, the sexual organs being seated on a shallow excavation at the end of the peduncle. They are polygamous, some consisting of carpels only, while others are hermaphrodite, or rather male with rudimentary female organs. The stamens and ovaries are numerous and indefinite, but equal in number. The anthers are adnate at the end of a short erect filament, 2-celled and laterally dehiscent, with a terminal apiculate connective. The ovaries are stalked, compressed, obovate, with no style, but a linear stigma lining the inner margin from the apex down to the point of insertion of the single pendulous ovule.

The Griffithian specimens have a very few old leaves only, in shape like those figured in the 'Flora Japonica,' and consist of slender twigs, with short lateral branchlets profusely covered with short pedicels, each supporting at its extremity a single flower, consisting of a fascicle of from 10 to 20 membranous samaræ. The apex of the pedicel is quite flat, and not excavated as in the flowering state of the Japan plant. The samaræ taper downwards into a stalk their own length, and are thin and membranous in texture, scarcely swelling out at the seeds, obovate in shape, with a deep notch about the middle on the ventral suture, marking the attachment of the seeds and the lower end of the narrow linear stigmatic surface, which extends upwards along the edge to the broad apex of the samara. The seeds are 2–4 in number, with a hard, black, brittle testa, granular but not oily albumen, and a small embryo not more than one-sixth the length of the albumen. They are quite anatropous, and are closely packed together, nearly filling the cavity of the samara, the greater part of which is a mere wing not separable into two laminæ.

The structure of this remarkable plant is so simple, and at the same time points in so many directions, that it is not easy to determine its nearest affinity. As we have said, Siebold and Zuccarini refer it to Ulmaceæ, remarking that its carpels, though indefinite, would, if united in the axis, form a fruit only differing from that of *Ulmus* in being polycarpellary. Though the structure of the fruit and seeds by no means confirms this conjecture, it is worthy of note that the Indian specimens had, in the rough sorting of Griffith's plants, found their way into Ulmaceæ, and therefore did not attract particular attention till that family was being arranged for distribution.

Technically, of course, from the entire absence of floral envelopes, our plant should be placed in the Incomplete division of Exogens; but when we try to find a place for it in any of the families of Monochlamyds, the result is anything but satisfactory. The families with an inferior ovary may, in the first place, be left out of the question; and from most of those with a superior ovary the absence of stipules and the minute embryo remove it to a distance. Indeed it is needless, we think, to compare it with any but the apocarpous Monochlamyds, Lauraceæ, Myristicaceæ, Monimiaceæ, Proteaceæ, Thymeleæ and Piperaceæ. With some of these *Euptelea* agrees in the minute embryo, but in all other respects it is too different to make it possible to associate it with any of them in the same family. The minute embryo is no doubt a character of great importance, though not necessarily a mark of affinity, and existing in too many families to be available for the determination of affinity.

The stamens and carpels of *Euptelea* are so evidently seated on the torus, that we need not compare it with any calycifloral families. There is no doubt something in the habit which suggests a relationship to certain Saxifrageæ and to Hamamelideæ, but there is nothing in the essential characters to support this resemblance.

It is therefore among apocarpous Thalamifloræ, as a reduced and anomalous type, that *Euptelea* must find a place, unless indeed it be thought preferable to constitute of it a distinct family, in which case it would of course go to Incompletæ. This we think would be an unsatisfactory step; for although there is no family of apocarpous Thalamifloræ to which it can be referred without hesitation, it approaches several of them so very closely that its natural place seems to be in close proximity to them. The numerous samaroid carpels resemble a good deal those of *Thalictrum*; but the characters of the seed, and especially of the albumen, do not confirm this resemblance, while the habit is too different from that of Ranunculaceæ to make it desirable to place it there. The hard testa of the seed, the granular albumen, and the minute embryo agree with Magnoliaceæ; but the serrate leaves, with a sheathing base without stipules, are nowhere found in that order. In this character of the leaves—and further, in their close straight venation—we have an approach to Dilleniaceæ, from which the samaroid carpels and the want of an aril are sufficient distinctions. Anonaceæ and the other apocarpous families are too different to afford grounds of comparison.

The nearest affinities of *Euptelea* appear to us to be with Ranunculaceæ and Magnoliaceæ; and though, in the absence of floral envelopes, there is no very marked line of demarcation between these two families, yet the woody habit and the structure of the seed incline the scale in favour of Magnoliaceæ, in the first section of which, Wintereæ, which is characterized by the want of stipules and by the carpels forming a single verticil, we propose for the present to leave this very anomalous plant.

Were it not that Siebold and Zuccarini described their plant as one-ovuled, we should consider the Indian species identical with that of Japan. As this is a point on which a mistake is not probable, we propose to call the Mishmi plant *E. pleiosperma*, resting the diagnosis on the presence of 2–4 seeds in the ripe samara*.

A New Genus of *Hepaticæ*. By W. Mitten, A.L.S.

[Read December 17, 1863.]

Adelanthus.

Perianthium in ramulo brevi ventrali ad basin ramorum celatum, tubulosum, subtrigonum, ore connivente dentato. Involucri folia trifaria. *Flores* masculi in spicis parvis ventralibus. *Caulis* inferus procumbens, intricatus; stoloniferus aphyllus, ramis simplicibus erectis curvatis. *Folia* disticha, fere verticalia, margine dorsali decurrente.

A. falcatus. Jungermannia falcata, *Hook. Musci Exot.* t. 89. Plagiochila falcata, *Synops. Hepat.* 649. Alicularia occlusa, *Hook. f. et Tayl. Crypt. Antarct.* t. 62. f. 8.

Hab. New Zealand, *Menzies and Colenso*; Tasmania, *Gunn and Oldfield.* Lord Auckland's Islands and Campbell's Island, *Dr. J. D. Hooker.*

This species, so well figured in the 'Musci Exotici,' has been long misunderstood from Dr. Taylor's mistake in considering the perianths to belong to some *Aneura* accidentally intermixed with the original specimens; but so great is the resemblance of the habit and foliage to some well-known species of *Plagiochila*, as *P. opposita*, Nees, and *P. conjugata* (*Jungermannia*, Hook. Musci Exot. t. 91), that it was hardly to be expected that the fructification could be so different; add to this the fragility of the perianth itself, which seems partially decayed by the time the capsule has arrived at maturity, and it is easy to account for the error.

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* Within the last few days we have had an opportunity, through the kindness of Professor Miquel, of examining the carpels of *E. polyandra*, which are one-ovuled, as figured by Siebold and Zuccarini.

A. MAGELLANICUS. Perianthio elliptico-oblongo, apice dentato; involucri foliis parvis, dentatis.—*Plagiochila Magellanica,* Lindenberg, Sp. Hepat. 164; Synops. Hepat. 53. *P. sphalera* et *P. unciformis,* Hook. fil. et Tayl. Crypt. Antarct. t. 156. f. 5 et 8.

Hab. Magellan, *Montagne in Hb. Hook.* Hermite Island, Cape Horn, *Dr. J. D. Hooker.* Staten Land, *Menzies.* Cordillera de Raneo, Chili, *Lechler,* No. 2943. Chimborazo, *Jameson.* Falkland Islands, *Lechler,* No. 104. Tasmania, *Gunn, Hb. Hooker.*

Very variable in size, from half an inch to three inches in height, and the outline and denticulation of the inferior leaves is also variable; in the Tasmanian specimens all the leaves are entire, but there appears to be no other difference.

A. LINDENBERGIANUS. Plagiochila Lindenbergiana, *Lehm. in Linnæa,* iv. p. 367; *Pugill.* pl. iii. p. 53; *Syn. Hepat.* 59.

Hab. Cape of Good Hope, *Ecklon and Milne.*

Leaves rather more acute than is usual in the preceding species, but presenting no other difference; and unless some character is afforded by the perianth, as yet unknown, it can scarcely be distinguished.

A. DICIPIENS. Foliis involucralibus rotundatis, concavis, brevidentatis; perianthio ovato, ore parvo dentato.—*Jungermannia decipiens,* Hook. Brit. Jung. t. 50. *Plagiochila decipiens,* Nees et Mont.; Lindenberg, Species Hepat. t. 12; Gottsche, Lindenberg et Nees, Synops. Hepat. p. 24. *Plagiochila campylodonta,* Hook. fil. et Taylor in Lond. Journ. Bot. 1845, p. 80; Synops. Hepat. p. 639. *Gymnanthe decipiens,* Mitten in Journ. of the Proc. Linn. Soc. vol. vii.

Hab. Ireland, first gathered by *Miss Hutchins.* St. Helena, *Dr. Hooker.* Fernando Po, *Mr. G. Mann.* Quito, *Prof. Jameson.* Peru in Monte Tunguragua, *Mr. Spruce.*

The discovery of the perianths on Mr. Spruce's specimens has at length set at rest the hitherto doubtful place of this species, which has considerable resemblance to some species of *Plagiochila* and *Gymnanthe.*

The position of this genus appears to be near to *Sphagnœcetis,* Nees; and in the substance of its leaves, male inflorescence, and form of the perianth it entirely agrees; but differs in the erect branches, absence of stipules, and in the insertion of its appressed secund leaves.

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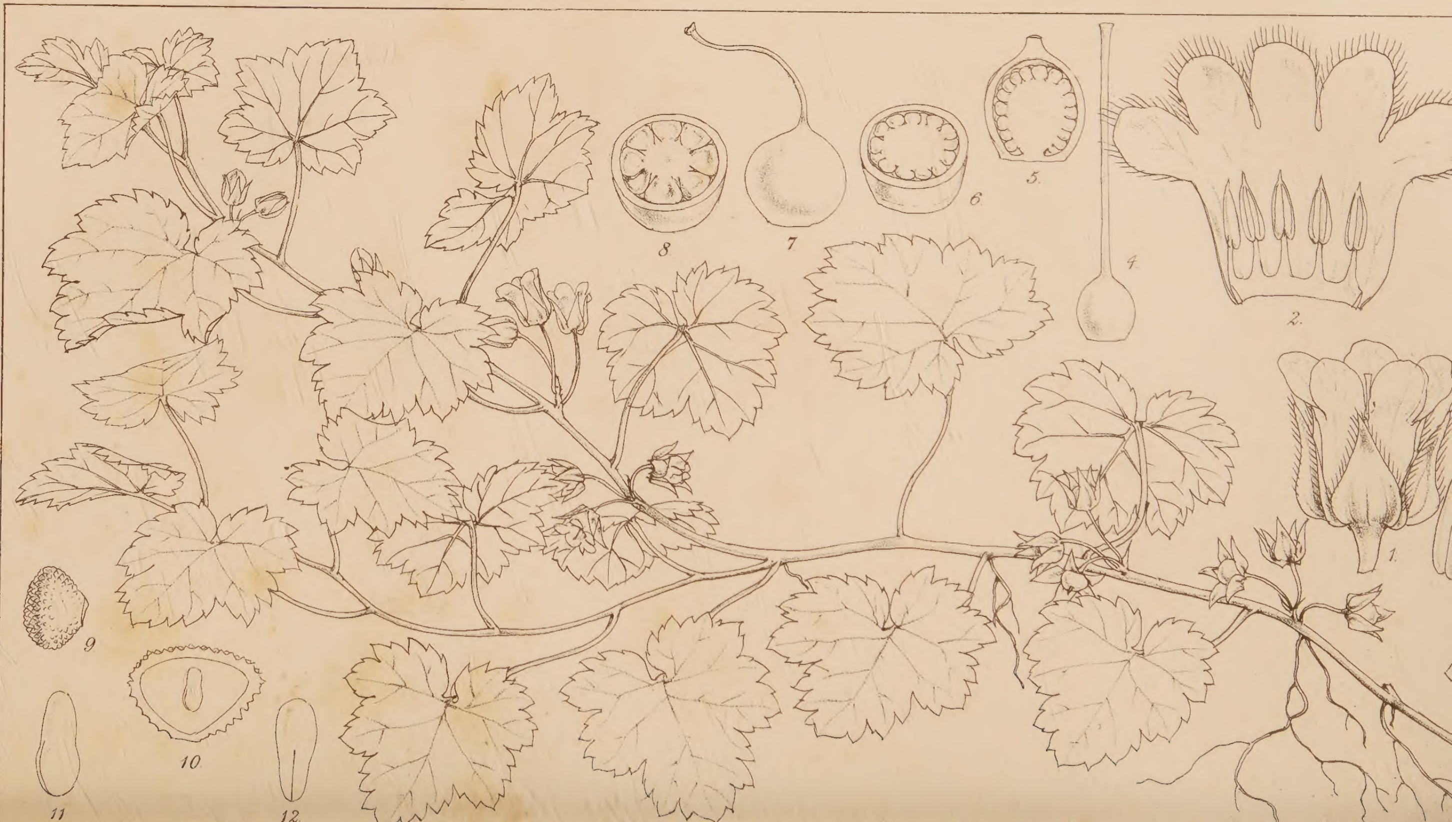
Printed by Taylor and Francis, Red Lion Court, Fleet Street.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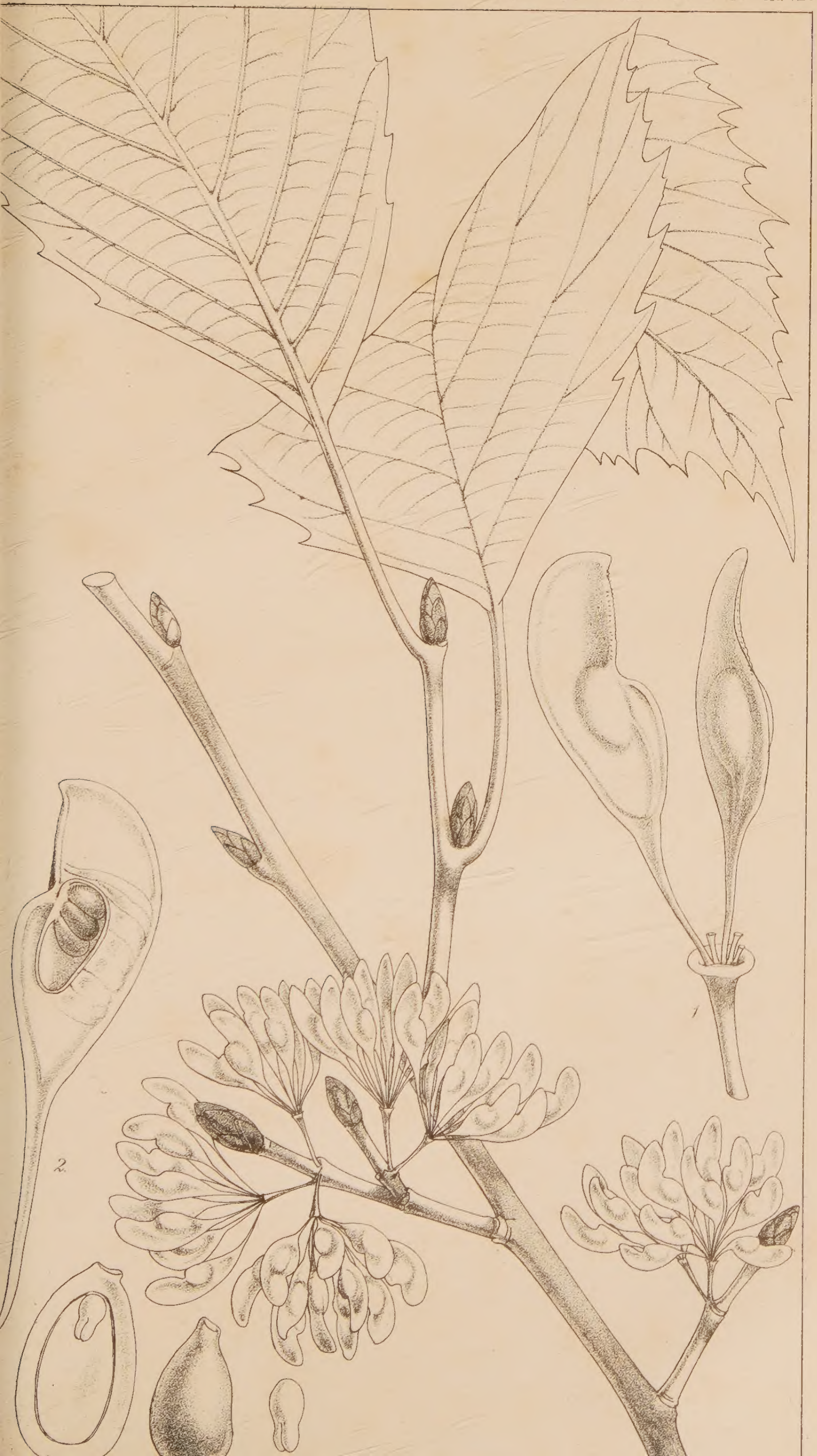
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